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CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT

ADDRESSES AND ORIGINAL ARTICLES

*Makers of John Hunter. By W. SAMPSON HANDLEY, F.R.C.S. 369

*Suppurative Pneumonitis and Lung Abscess: The Value of Radiology. By A. GARLAND, M.D., and F. R. BERRIDGE, M.B., D.M.R. 375

*Fibrocystic Disease of Bone, with Skin Pigmentation and Endocrine Dysfunction. By K. ROBSON, M.R.C.P., and J. W. TODD, M.R.C.P. 377

Treatment of Pneumonia with 2-(*p*-Aminobenzenesulphonamido) Pyridine (M. & B. 693). By A. L. AGRANAT, M.R.C.P.E., A. O. DREOSTI, M.D., and D. ORDMAN, M.B. (*concluded*) 380

The Use of Stored Blood for Transfusion. By G. A. ELLIOTT, M.R.C.P., R. G. MACFARLANE, M.D., and J. M. VAUGHAN, M.R.C.P. (*illus.*) 384

Collection and Transfusion of Preserved Blood. By C. R. BOLAND, M.D., N. S. CRAIG, M.D., and A. L. JACOBS, M.R.C.P. (*illus.*) 388

CLINICAL AND LABORATORY NOTES

Cardiazol Convulsions. By J. E. O. N. GILLESPIE, M.B. 391

Addison's Disease in a Boy of 12. By A. RENSHAW, M.D., and G. B. MANNING, M.B. 392

MEDICAL SOCIETIES

Royal Society of Medicine: Section of Orthopædics: Congenital Dislocation of the Hip 393

Medical Society of London: Use and Abuse of Purgatives 394

REVIEWS AND NOTICES OF BOOKS

The Pituitary Gland. Edited by W. Timme, A. M. Frantz, and C. C. Hare 397

Clinical Studies in Lactation. By H. Waller, M.B. 397

Tuberculosis Among Children and Young Adults. By J. A. Myers, M.D. ... 397

Pye's Surgical Handicraft. Edited by Hamilton Bailey, F.R.C.S. 398

Bacteriology. By Prof. A. D. Gardner, F.R.C.S. 398

A Concise Pharmacology. By F. G. Hobart, Ph.C., and G. Melton, M.R.C.P. 398

Practical Microbiology and Public Health. By Prof. W. B. Sharp, M.D. 398

Clinical Obstetrics. By Prof. A. L. Mudaliar, M.D. 398

LEADING ARTICLES

IMMUNISATION WITH ARTIFICIAL ANTIGENS 399

THE LOST SWAB 399

DEEPER DIVING 400

ANNOTATIONS

An Epidemic of Toxic Polyneuritis 401

Thrombosis After Herniotomy 402

Supervoltage X Radiation. 402

Vaccinia Propagated in Hen's Eggs 402

Sulphanilamide Cyanosis .. 403

How Far Cancer is Now Treated Adequately 403

Constructive A.R.P. 404

Postoperative Circulatory Failure 404

Stored Blood for Transfusion 405

THE AIR-RAID

VII—Wounds of Bones and Joints. P. H. MITCHINER, F.R.C.S., and E. M. COWELL, F.R.C.S. (*illus.*) 408

GRAINS AND SCRUPLES

From Autolycus. III—Speeches and Addresses. 411

SPECIAL ARTICLES

The Blood-test on Trial... 406

Milk and Disease: A Deputation to the Ministry of Health 406

Scotland: Edinburgh Surgical Chair 407

Medical Mobilisation..... 424

The Hunterian Festival... 424

Medicine and the Law: Trauma and Sarcoma... 425

Infectious Disease in England and Wales 421

THE LANCET 100 Years Ago 423

THE LANCET Index, Vol. II, 1938 423

LETTERS TO THE EDITOR

Protection of Children in Time of War (Mr. H. D. Watson) 413

Torsion of the Appendix of the Testis (Mr. J. Hosford, F.R.C.S.) 413

As Others See Us (Dr. G. H. Crisp) 414

Prophylaxis of Tuberculous Empyema (Dr. L. Roberts) 414

Stigma and Prejudice (Dr. J. R. Whitwell) 414

The Feet of the Industrial Worker (Dr. T. Marlin).. 415

Excretion of Injected Aneurin (Mr. M. Pyke, Ph.D.) 415

Clinical Use of Stilbœstrol (Mr. W. R. Winterton, F.R.C.S.) 416

Septicæmia or Bacteræmia? (Mr. H. A. T. Fairbank, F.R.C.S.) 416

"Mothers' Welfare Centres" (Dr. M. H. Jackson) 416

The Nature of Viruses (Sir Patrick Laidlaw, F.R.C.P., F.R.S.) 416

OBITUARY

Prof. Charles Cyril Okell, F.R.C.P. (*with portrait*).. 422

Prof. Arthur Smithells, F.R.S. 423

Thomas Freeman Long, M.R.C.S. 423

PARLIAMENT

Blood-tests in Bastardy Cases—Cancer Treatment 417

Notes on Current Topics: Workmen's Compensation 418

Question Time: Cost of Living Inquiry—Government Camps for Civilians—Emergency Hospitals in War-time—Conditions in Coastal Ships..... 418

MEDICAL NEWS

University of Cambridge .. 420

University of London 420

University of Sheffield 420

University of Manchester . 420

Royal College of Surgeons of England 420

Royal College of Physicians of Edinburgh 420

Royal Institute of Public Health and Hygiene.... 420

Society of Public Analysts.. 420

Royal Statistical Society.. 421

Lectures on Sex Education 421

Hospital Almoners' Association 421

Hunterian Society: Annual Dinner..... 421

National Nursing Need ... 421

Katherine Bishop Harman Prize 384

Postgraduate Medical Courses in Italy..... 405

London School of Hygiene and Tropical Medicine.. 407

Memorial to Sir Frederick Mott 412

NOTES, COMMENTS AND ABSTRACTS

The Prevalence of Contraception: Raymond Pearl's Study 428

Iron, Calcium and Phosphorus 429

"The Stronghold" 429

A National Language for India 429

Pain in Cancer of the Cervix 430

Annual Report of a G.P... 430

Sulphanilamide Eruption.. 430

An Information Service in Human Genetics 430

The All Too Common Cold 396

Appointments 426

Vacancies 426

Medical Diary 427

Births, Marriages, Deaths . 430

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JAMES MAXWELL, M.D. (Lond.), F.R.C.P. (Lond.)

Assistant Physician and Demonstrator of Practical Medicine, St. Bartholomew's Hospital; Physician, Royal Chest Hospital; Consulting Physician, Royal National Sanatorium, Bournemouth

CONTENTS

SECTION I
THE HISTORY

CHAP.
1. THE SIX MAJOR SYMPTOMS
2. THE SIX MAJOR SYMPTOMS (*contd.*)
3. MINOR SYMPTOMS
4. THE AUXILIARY HISTORY

SECTION II
PHYSICAL EXAMINATION OF THE CHEST

5. INSPECTION
6. PALPATION
7. PERCUSSION
8. AUSCULTATION

SECTION III
SPECIAL INVESTIGATIONS

9. THE SPUTUM
10. BLOOD EXAMINATIONS—PLEURAL FLUID
11. RADIOLOGY OF THE CHEST
12. SPECIAL DIAGNOSTIC METHODS

SECTION IV
DISEASES OF THE RESPIRATORY TRACT

13. THE NOSE
14. THE MOUTH
15. THE LARYNX
16. THE TRACHEA AND BRONCHI

SECTION IV
(*continued*)

CHAP.
17. ASTHMA
18. BRONCHIECTASIS
19. TUMOURS OF THE BRONCHI
20. CHEST INJURIES — DISORDERS OF THE PULMONARY CIRCULATION
21. EMPHYSEMA
22. COLLAPSE OF THE LUNG
23. PNEUMONIA
24. BRONCHO-PNEUMONIA
25. PNEUMONITIS
26. LUNG ABSCESS
27. PULMONARY TUBERCULOSIS
28. PULMONARY TUBERCULOSIS (*contd.*)
29. TREATMENT OF PULMONARY TUBERCULOSIS
30. NON-TUBERCULOUS CHRONIC LUNG INFECTIONS
31. FIBROSIS OF THE LUNG
32. THE PLEURA
33. "PLEURISY"
34. EMPYEMA
35. TUMOURS OF THE PLEURA
36. THE MEDIASTINUM
37. THE DIAPHRAGM

INDEX

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MAKERS OF JOHN HUNTER *

By W. Sampson Handley, M.S. Lond., F.R.C.S.
CONSULTING SURGEON TO THE MIDDLESEX HOSPITAL, LONDON; COUNCILLOR OF THE ROYAL COLLEGE OF SURGEONS

(WITH ILLUSTRATIVE PLATE)

It is a tribute to the broad-mindedness of my countrymen that John Hunter, the presiding genius of this College of Surgeons of England, was not an Englishman. Nothing, unless it be the Crown itself, could better illustrate the unity of this island of Great Britain or the beneficent exchanges between its northern and southern parts which have followed the Act of Union of 1707, exchanges which gave the Hunters to England and Lister for a time and at a later period to Scotland. It would be a mistake, however, to regard John Hunter as a missionary from the north *in partibus infidelium*. His medical education was due entirely to London, and he received it primarily from his elder brother.

William Hunter also, though indebted to Scotland for his literary education, for his medical apprenticeship to Cullen—a physician of the old systematic school—and for a year's attendance at Edinburgh University, found his inspiration in his "darling London" in the house of Dr. James Douglas, the leading anatomist of his time and an admirer and disciple of William Harvey.

It is my main object in this address to trace the intellectual descent of Hunter from Harvey, for I believe it has been overlooked. You shall judge of the evidence, and I will present it with a minimum of comment. I wish specially to speak of John's teacher, his elder brother William, once a member of the staff of the Middlesex Hospital, which I now am privileged to serve, and to reassess his contributions to knowledge. I can add nothing fresh to the details of William Hunter's life as described by Simmons and others, and confess my indebtedness to them.

Others who come into my story of the makers of Hunter are the brothers James and John Douglas, Cheselden of St. Thomas's and the Westminster Hospitals, pupil of James Douglas and teacher of John Hunter, and Mrs. Hunter, his charming wife.

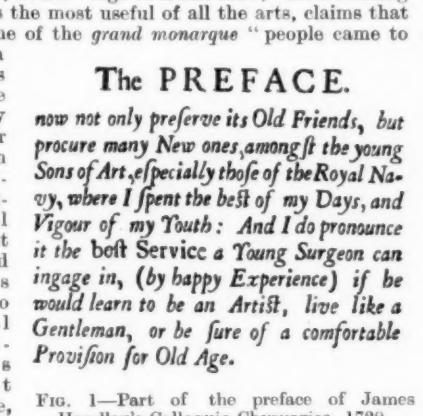
SURGERY IN THE EARLY EIGHTEENTH CENTURY

At the opening of the eighteenth century the barbers and surgeons were still united in one guild (note the precedence of the barbers), which was dissolved in 1745, its monopoly of subjects for dissection being thus broken, to the advantage of William Hunter's school, founded a year later.

The surgeon of the period following the Act of Union of 1707 was often a Scot, and he can be studied in the frank pages of "Roderick Random" (published 1748) by Smollett, who, like his hero, was a naval surgeon. This book had an instant success, and it may very likely have influenced or perhaps even determined John Hunter's choice of a profession. It was published in the year he came to London, and its rough candour would be likely to appeal to him.

Smollett may have learnt his surgery in the pages of Wiseman or of James Handley, also a naval surgeon, who in 1720 published the third edition of his "Colloquia Chyrurgica," a small book containing in the author's belief all the anatomy and surgery that a surgeon need know (fig. 1). The book, though illuminated by many flashes of common sense and by the wisdom of experience, is founded on the old humoral doctrines and affords an excellent idea of the state of surgery at that time. It is to be noted that the popular textbooks of the time were English, though Maister Peter Lowe of Glasgow had written an earlier textbook. The Edinburgh medical school was not founded until 1720, and Monro, its founder, was born and educated in London. London, however, at this time held a position much inferior to Paris, Padua, and Leyden.

Voltaire, in his "Age of Louis XIV," after ranking surgery as the most useful of all the arts, claims that in the time of the *grand monarque* "people came to Paris from the ends of Europe for any cure or operation that required exceptional skill." Not only good surgeons but also surgical instruments were at that time, he says, almost the monopoly of Paris. He goes on: "I have heard from the mouth of the great Cheselden, the greatest surgeon in London, that it was he who first began to make in London, in 1715, the instruments of his art." The forces which ultimately revolutionised surgery were already at work, but in the early eighteenth century they had produced little effect.


The PREFACE.

now not only preſerve its Old Friends, but procure many New ones, amongſt the young Sons of Art, eſpecially thoſe of the Royal Navy, where I ſpent the beſt of my Days, and Vigour of my Youth: And I do pronounce it the beſt Service a Young Surgeon can ingage in, (by happy Experience) if he would learn to be an Artiſt, live like a Gentleman, or be ſure of a comfortable Proviſion for Old Age.

FIG. 1—Part of the preface of James Handley's Colloquia Chyrurgica, 1720.

WILLIAM HARVEY

The discovery of America by Cabot and Columbus at the end of the fifteenth century discredited ancient geography and awakened in other branches of science a distrust of ancient lore which led to first-hand observation and experiment. At Padua, when Harvey (1578–1657) went to that university about the year 1600, Galileo was reforming Ptolemy's astronomy. Harvey was the first Englishman to use the new highway to medical knowledge. The critical date when medical tradition in England began to be replaced by observation and experiment is 1628, the year in which Harvey published his work on the circulation, "De Motu Cordis et Sanguinis." Harvey says, "I have not endeavoured from causes and probable principles to demonstrate my propositions, but as of higher authority, to establish them by appeals to sense and experiment." In these simple words he announced a revolution of thought and made St. Bartholomew's Hospital the English cradle of modern physiology and morbid anatomy. Harvey planned a book on "Medical Anatomy" based upon "the many dissections I have made of persons diseased, worn out by serious and strange affections, how and in what way the internal organs were changed from their natural form and appearances." It was

* The Hunterian Oration of 1939 delivered on Feb. 14.

reserved for Morgagni in 1761 and Matthew Baillie, nephew of the Hunters, in 1793 to carry out this plan. *Ars longa, vita brevis.*

I shall try to show how, through James Douglas, his brother John Douglas, and William Hunter, John Hunter learnt the methods of Harvey, which he applied to surgery with such far-reaching results. According to Buckle, the Scottish mind is deductive rather than inductive, and this was certainly true in the eighteenth century. Delighting in a complete and logical structure of belief, the deductive mind prefers to start with a set of general principles, instead of working up to them from particular instances. It is therefore something of an anomaly that the Harveian method was first applied to surgery on a large scale by a Scotsman. John Hunter appreciated the fallacy of the deductive method, but his inherited need for a generalised and complete system of belief remained as strong as ever. With intense determination and unwearied industry he endeavoured to establish such a system by the laborious method of experiment and observation, without the aid of the microscope and with only rudimentary chemistry and physics. He did not arrive at his methods by the light of his own genius. When he arrived in London at the age of 20 his mind was practically a clean slate, and his delight in nature was a vague boyish wonder. He said later, "When I was a boy, I wanted to know all about the clouds and the grasses, and why the leaves changed colour in the autumn; I watched the ants, bees, birds, tadpoles, and caddis-worms; I pestered people with questions about what nobody knew or cared anything about." William Hunter showed him how to work, planting his feet firmly upon the shoulders of his predecessors.

JAMES DOUGLAS

James Douglas, the teacher and exemplar of William Hunter, came, like the Hunters, from the class of Scottish minor lairds which corresponds to the English yeoman class of which Harvey sprang. His early education is veiled in obscurity, but according to Mr. George Peachey, after obtaining an M.D. at Rheims he settled in London as a private teacher of anatomy in 1706. In that year from "the Blew Boar over against the end of Fetter Lane" he announced a course of human and comparative anatomy. In 1707 he published the first extant work on comparative anatomy, a science of which he was the founder. The book was called "Myographiæ Comparatæ Specimen, or A Comparative Description of the Muscles in a Man and in a Quadruped."

He says, "I took all the descriptions from ocular inspection, in dissection, using twelve subjects to make sure. . . . I chose a dog for comparison because young students of anatomy may readily procure so common a subject." He considered anatomy in twenty-five lectures illustrated by his own dissections, and then passed to comparative anatomy, showing the glands, lymphatics, eye, ear, and stomach of various animals, and parts of the oyster, skate, lobster, and whiting. The course concluded with "the history of the animal economy, mastication, deglutition, digestion, chylification, sanguification, circulation in the fœtus and adult, nutrition, secretions, generation, respiration, and muscular motion."

In 1706, on the proposal of Dr. Hans Sloane, and perhaps because of his interest in botany, he was elected F.R.S. He wrote papers on the autumn crocus, the culture of saffron in England, cinchona, and the coffee tree. Though not a member of the staff, he appears to have had the freedom of St. Bartholomew's Hospital, for he studied the anatomy of disease and was permitted to perform necropsies there. It is recorded that, long before Laennec and his stethoscope, he heard in the hospital an aortic murmur. In 1715 he published a general bibliography of anatomy "from Hippocrates to Harvey" and was appointed Arris lecturer on the muscles at Barber-Surgeons' Hall. The book shows fair-mindedness, scholarship, and complete lack of egotism and self-glorification. It is of special interest as disclosing the source of his inspiration not only in its title but also in its references to Harvey, whom he calls *senex divinus*. The whole literary world, he says, deplores the loss of the manuscript treatises of Harvey which disappeared in the confusions of the civil war. His dislike of acrid controversy appears in his remark that "though reproved and provoked by many, Harvey forbore to reply except to Riolan, and to him gave criticism rather than rebuke."

James Douglas realised the need of surgery for anatomical knowledge and had in his house a complete collection of preparations showing every possible surgical method of reaching the interior of the bladder, and the advantages and inconveniences of each method so far as these depend on the structure of the parts. He practised midwifery, became physician to the Queen, and is recognised in Pope's "Dunciad" as the obstetrician of his time. He also published a catalogue of the editions of Horace which he had collected, but anatomy continued to be his main interest.

In 1730 he published his "Description of the Peritoneum," for he is Douglas of Douglas's pouch and semilunar fold. The book was dedicated to the magnificent Dr. Richard Mead. His youngest brother, George, dedicated to James Douglas "with the utmost sincerity, gratitude, and respect" a translation of Winslow's "Anatomy." The dedication declares: "To you I owe all that I know, not only of the Science, but of the Stile of Anatomy, and there is not one good line in this Translation which is not the better for what you have taught me, or procured me opportunities of learning." Every contemporary reference to James Douglas appears to be equally cordial and friendly. Cheselden calls him "that most accurate and indefatigable anatomist," and Warburton, the biographer of Pope, calls him "a physician of great learning and no less taste."

It would seem that James Douglas fulfilled Burke's exacting description of a good man as having good nature for the basis of his character, and a desire to love, to serve, and to oblige everybody in everything as the very essence of his soul. It is perhaps characteristic of the man that he left behind no portrait of himself. He was buried at St. Andrew's, Holborn, the parish in which he lived, but even his grave has disappeared. It lay somewhere beneath the present Holborn viaduct.

JOHN DOUGLAS

John Douglas, doubtless helped by James, who was always ready to serve others, applied his brother's anatomical lessons to surgery and was the first surgeon to practise suprapubic lithotomy. He was led to the operation by instances within his knowledge of recovery after penetration of the bladder by the horn of a bull, by gunshot, and by a sword. Like James, John wished to acknowledge the merits of others, and at the end of his book "Lithotomia Douglassiana" (1723) he gave in full the early work of Rousset,† the French surgeon, who had suggested but not performed the suprapubic operation in the

† François Rousset, De Partu Cæsario, 1581.

sixteenth century. Rousset was unfortunate. He says sadly, "the lamentable Fate of King Henry III (who had promised me four or more Persons that were condemned to Death to make the Experiment upon, and them their lives if they recovered) deprived me of the Opportunity." (Fig. 2 shows the bookplate of John Douglas.)

FIG. 2
Bookplate of John Douglas.

WILLIAM CHESELDEN

After a vogue of only about seven years the suprapubic operation was replaced by Cheselden's lateral operation. Cheselden cured 50 out of his first 52 patients at St. Thomas's Hospital and Westminster Infirmary, and his success greatly alarmed the surgeons of Paris. He was one of James Douglas's early pupils, and there can be no doubt that he owed his success largely to his master in anatomy. It is significant of James Douglas's open-mindedness that he became an advocate of Cheselden's method in preference to his brother's operation. He says, "Mr. Cheselden is much less sollicitous for the credit of being an inventor than he is to have his operation understood and practised in a right manner for the good of the public"—a good keynote for the young profession of surgery. It was Cheselden who, in old age, gave John Hunter his first lessons in the art.

WILLIAM HUNTER (1718–83)

William Hunter (fig. 3), born at Long Calderwood, Lanarkshire, was a serious and quiet boy, ten years older than John. The current of his life ran in deep channels of feeling and resolution but presented a quiet surface beneath which it was difficult to peer. Quite early he took a firm grip of himself which never relaxed. No hypocrite, he was emphatically a good boy who never gave a moment's anxiety to his parents and teachers. Mrs. Baillie, contrasting the characters of the two boys, preferred that tempestuous infant John, a notorious cry-baby and rebel, to the good but enigmatic William. For five years William, destined for the church, pursued his theological studies at Glasgow. Then something happened to disturb his convictions, probably his acquaintance with Dr. Cullen, then in practice near Long Calderwood, but in giving up the church and turning to medicine he remained the slave of his conscience and of his high ideals. Pride was the keynote of his character, and only if he felt his honour assailed would he defend or excuse his actions.

In 1740 he studied medicine for a year in Edinburgh under Monro the first, but in 1741 he decided to try his fortune in London. He was the pioneer who prepared the way for John. In succession to Samuel Sharpe of Guy's Hospital he became lecturer to a society of naval surgeons. He was fortunate in becoming assistant to Dr. James Douglas, whose career we have already traced. He lived in Douglas's house and fell in love with Miss Douglas, to whom he became engaged. Her early death broke the romance, and he never married. His paternal instincts found an outlet in the education of the uncouth genius John, whom he vainly tried to make into an Oxonian, and later in his care of his sister's brilliant children, Matthew and Joanna Baillie.

His generosity had a touch of severity, for at the University Matthew was "pinsh'd for cash" and was told "first deserve, then expect." The system seems to have worked well. In 1746 William Hunter advertised his first private course of anatomy, as James Douglas had done forty years earlier, and to the end of his life anatomy and the teaching of it were his ruling interests; but he took up the practice of man-midwife and became physician to the Queen. In this, as in many other respects—for instance, the collection of editions of Horace—he followed closely the footsteps of James Douglas.

In 1767 he was elected F.R.S., and in 1768 he became a Fellow of the Society of Antiquaries and professor of anatomy in the newly established Royal Academy (see plate). He now (in the quaint language of that day) "extended his views to fossils, and likewise to the promotion of polite literature and erudition." In a short time he owned "the most magnificent treasure of Greek and Latin books that has been accumulated by any person now living since the days of Mead." These are the words of an expert bibliophile of the time, Dr. Harwood, and we find Hunter detecting a small difference between two copies of the same edition of Theocritus. Coins, especially those of the Greek free cities, next attracted his attention, and upon this department of his museum he spent more than £20,000.

FIG. 3—William Hunter.

At this period of his life William Hunter had become almost a national figure, a famous anatomist, a friend of the sovereign, and the trusted physician of the Queen, a celebrated dilettante and princely collector, meeting artists and literary men on their own ground. Little can he have thought that his brother John was destined to surpass him in reputation.

He died in 1783, a few days after leaving a sick bed to lecture at his Great Windmill Street School. He bequeathed his museum to the University of Glasgow, his old alma mater. Can it be doubted that the mainspring of John's career was a fierce determination that he, the ne'er-do-well of the family up to the age of twenty, would show his ability to surpass William's brilliant achievements? The rivalry, at first unconscious and for many years quite friendly, exploded in the quarrel which separated the brothers in their latest years, only to be partly made up just before William's death in 1783.

THE GREAT WINDMILL STREET SCHOOL OF ANATOMY

The Great Windmill Street School, comprising a spacious house, a lecture theatre, dissection rooms, and a great museum, was founded by William Hunter in 1770 after the rejection by the Government of his generous offer to erect and endow at his own expense a national School of Anatomy. It was the earliest complete anatomical school in London, and the first to adopt the Paris system by which the student himself dissects the whole body under supervision of the teacher. William Hunter had a passion for teaching and says of himself: "to acquire knowledge and to communicate it to others has been the pleasure, the business, and the ambition of my life." He preferred to teach by word of mouth, rather than by his pen, and continued to do so for thirty-six years. His failure to print his views on the lymphatic system embroiled him during his life in red-hot controversy with Monro the second.

The smallness of his literary output has tended to dwarf William's stature in comparison with his brother's, but for style and clarity John cannot compare with him. One classic work on the gravid uterus, two perfectly finished introductory lectures to his anatomy course, and a few scattered clinical papers are his only literary remains, if we except his strangely named "Medical Commentaries," a passionately controversial work wrung from him by what he regarded as an attack upon his honour by Monro the second. We must regret the nerve energy expended on this volume. Harvey was wiser and left his detractors alone.

William Hunter can be judged partly by the impression he produced upon his contemporaries, and Matthew Baillie said he was perhaps the best anatomical teacher that ever lived. But he should be estimated mainly by the history of his school and by its contributions to anatomy. An Edinburgh visitor spoke of it as follows: "The school in Windmill Street under the joint guidance of Dr. Wilson and Mr. C. Bell was remarkable in Messrs. Hewson and Cruickshank's time for its discoveries in minute anatomy, and it has not degenerated under Mr. Wilson's superintendence. The students will nowhere find such careful dissections of the nerves as those prepared for Mr. Bell's lecture. . . . The absorbents are also demonstrated and beautifully injected in the recent body, a mode far superior to that of exhibiting them upon dried preparations. To the best of my knowledge demonstrations of the absorbents are only made at Windmill Street." The author then refers to Mr. Bell's knowledge of military surgery acquired in the hospitals at Waterloo, and to the splendid series of anatomical preparations, mostly injected by Mr. Wilson himself and only equalled by Prof. Monro's in Edinburgh.

WILLIAM HUNTER AND THE LYMPHATIC SYSTEM

William Hunter was the first to enunciate correct views based upon rational grounds of the structure and functions of the lymphatic system. In so doing he controverted the view of Harvey that the lacteals contained milk, not chyle—i.e., fluid derived from the digestion of the food. William Hunter, who was inclined to think Harvey overrated, denied the absorption of fluid from the bowel by the portal venous system, and in this he was wrong. In other respects his views on the lymphatic system constituted a great advance. It was William Hunter who taught, trained, and paid Hewson (fig. 4) and Cruickshank. Each of these two men published after his death master works on lymphatic anatomy. But for William Hunter their works would not have been written, and it is their writings more than his own that proclaim William Hunter as the founder of lymphatic anatomy in this country. The elder Hunter's interest in the lymphatic system, his knowledge of the history of the subject, and the scrupulous desire to give credit to pioneers, which he inherited from the Douglas brothers, are shown in his introductory lecture to his course of anatomy, a masterpiece of clear and concise exposition. He says: "After the discovery and knowledge of the circulation of the blood, the next question would naturally have been about the passage and route of the nutritious part of the food, or chyle, from the bowels to the blood-vessels." He then relates the discovery of the lacteals by Aselli in 1627 and of the thoracic duct by Pecquet in 1651. Rudbeck and Bartholin detected the lymphatics which carry clear lymph and not milky chyle in 1653.

FIG. 4—William Hewson.

William Hunter goes on to say: "But none of the Anatomists of those times could make out the origin of the lymphatics, and none of the Physiologists could give a satisfactory account of their use." He then proceeds to put forward unequivocally his own claims, as having been the first to form a correct general notion of the anatomy and functions of the lymphatic system. In his own words, "I think I have proved that the lymphatic vessels are the absorbing vessels all over the body; that they are the same as the lacteals; and that these altogether, with the thoracic duct, constitute one great and general system, dispersed through the whole body for absorption; that this system only does absorb, and not the veins; that it serves to take up and convey, whatever is to make, or to be mixed with the blood, from the skin, from the intestinal canal, and from all the internal cavities or surfaces whatsoever. This discovery gains credit daily . . . and if we mistake not, in a proper time, it will be allowed to be the greatest discovery, both in physiology and pathology, that Anatomy has suggested, since the discovery of the circulation." Anatomists had believed that the lymphatic system was wanting in birds and fishes, and William Hunter, not satisfied on this point, kept it constantly in view. "Accordingly, my brother Mr. John Hunter, whom I bred to practical anatomy, and who worked for me, and attended my dissecting room, and read some lectures for me many years, found some lymphatics, first in birds, and then in a crocodile." From John Hunter's experiments he inferred erroneously that the veins do not absorb fluids.

"Next, Mr. Hewson, whom I first bred to Anatomy and took into my house to work for me . . . discovered and fully demonstrated the lymphatics and lacteals, both in birds and fishes." William Hunter inferred that the lymphatic system, if universal through the animal kingdom, must be important. He goes on: "And lastly Mr. Cruickshank, whom I likewise bred to Anatomy, . . . at my desire, has traced the ramifications of that system in almost every part of the body; and from his dissections figures have been made, which, with what I have had before, will enable us to publish (we hope in a little time) a full account of the whole system, illustrated by accurate engravings."

W. Hunter was dead before these words were printed, and the projected joint work never appeared. Cruickshank fulfilled the plan in his "Anatomy of the Absorbing Vessels" (2nd edition, 1790). In his preface he says, "In consequence of Dr. Hunter's death this business has now fallen on me. I should have had no small share in it had he lived, for I had made almost all the preparations from which the drawings were made." Cruickshank made many interesting observations on the lymphatic vessels. As an instance, he says (p. 197) that the intercostal lymphatics, of which two accompany each intercostal artery, can be injected easily with mercury from the thoracic duct. The mercury forces the valves and penetrates through the substance of the glands which lie between the heads of the ribs. He continues, "on one occasion I also injected their posterior branches, which then run backwards to the skin and muscles of the back, with the posterior branches of the intercostal arteries; in this subject they perforated the body of one of the vertebræ of the back, through whose substance I afterwards saw them ramifying. A demonstration that they also went to, or more properly came from, the bones."

In this short paragraph Cruickshank exposes the probable route by which spinal deposits reach the upper dorsal spine in breast carcinoma. I have shown that the glands of the anterior mediastinum may be infected as early as the axillary glands; thence the infection probably reaches the spine along the lymphatic vessels of the upper intercostal spaces. It would be difficult to find a better instance of the surgical value of lymphatic anatomy, for, given precise knowledge upon the subject, the prevention and treatment of these late spinal deposits could be hopefully approached by radiologists and radio-surgeons. Spinal metastasis is increasing in frequency owing to the elimination of fatal local recurrence by improved operative methods. Pathologists are too busy with their vast subject to supply the help surgeons and radiologists need in this matter. Some young surgeon or radiologist with a research scholarship should devote two or three years to the solution of the problem and become his own pathologist for his own special needs in the light of Cruickshank's observation.

Hewson's work on lymphatic anatomy, published in 1774, has been reproduced by the Sydenham Society.

Sir Charles Bell, who succeeded to the Windmill Street School and transferred some of its specimens to the new Middlesex Hospital School and later to Edinburgh, was more interested in the nervous system, and Cruickshank seems to have had no successor. It may be doubted whether in any anatomical school in Great Britain freshly injected specimens of the lymphatics are to be seen at the present time, though I recall the lymphatic work of the late Prof. Jamieson of Leeds and the associated surgical work of the late J. P. Dobson and of Mr. L. R. Braithwaite. At Charing Cross Hospital the late Mr. H. S. Clogg did notable work in the surgical lymphatic anatomy of the tongue. Mr. R. H. Burne, our former physiological curator, has described a new system of lymphatic vessels in the angler fish. A revival of lymphatic anatomy and physiology is very desirable in the interests of surgery, and more especially in the interests of cancer research. In cancer research at the present time two theories of origin, the virus theory and the chemical (tar) theory, face each other in apparent contradiction, each supported by substantial evidence and each ignoring the undoubted production of cancer by physical agents, such as light. Attempts to reconcile them involve very difficult assumptions, such as the almost universal presence of a cancer virus or the formation in the body of cancerogenic hydrocarbons. The observation made by myself (The Genesis of Cancer, 1931, H. K. Lewis) that in areas of tissue about to become cancerous the lymphatic vessels are obliterated, has been ignored by pathologists, but it is the most likely clue to the unravelling of the tangle. If the whole character of the vegetation of a field can be radically altered by the blocking of the pipes which drain it, it is hardly surprising if local chronic lymphstasis in the body may ultimately breed a race of cancer-cells. The virus or the tar are in my view cancerogenic agents, because they set up in the lymphatic vessels an obliterative lymphangitis. Research scholarships specifically restricted to the lymphatic system are urgently needed, and this College would doubtless be willing to administer them under the able superintendence of Prof. Beattie in our new Bernhard Baron laboratories or at the Buckston Browne farm. The work of William Hunter has been left half-finished.

GENEROSITY OF THE HUNTERS

The Hunters were proud and generous, like many of their much-maligned countrymen. In Clift's time fifty persons fed daily at John Hunter's expense. Though both the brothers made large incomes, neither died rich, and John died possessed of little but his museum. I find, thanks to researches made in the Record Office on my behalf by Miss E. O'Farrell, that in July, 1779, he asked relief of the Court of Chancery in respect of a bond into which he had entered to oblige a friend, a young sprig of Scotch nobility, the Hon. Lockhart Gordon, stating in his petition that "without some such relief and assistance your Orator (petitioner) and his family must be inevitably ruined" (see Appendix).

MRS. JOHN HUNTER

In July, 1771, John Hunter married Anne Home, then aged 29, daughter of an army surgeon in Burgoyne's Regiment of Horse. She seems to have been a lady of wonderful charm and social gifts. Her portrait speaks for her (fig. 5). Rogers (The Modern Scottish Minstrel, 1855) says of her: "During the lifetime of her distinguished husband, Mrs. Hunter was in the habit of receiving at her table and sharing in the conversation of the chief literary persons of her time. Her evening conversazioni were frequented by many of the more learned, as well as fashionable persons in the metropolis. She was the life of her social parties, sustaining the happiness of the hour by her elegant conversation, and encouraging the diffident by her approbation. Amiable in disposition she was possessed of a beautiful countenance and a handsome person. She wrote verses with facility, but she sought no distinction as a poet,

preferring to be regarded as a good housewife and an agreeable member of society."

Among the lions of Mrs. Hunter's salon were the composer Haydn and Mrs. Montagu, founder of the Blue Stocking Club, evidently a mixed club, for it took its name from the colour of the hose of Benjamin Stillingfleet, son of a bishop, traveller, naturalist, and oracle of the club. Mrs. Hunter supplied Haydn with the words of his "Englische Original-Canzonetten," a book of twelve songs, of which the best known is "My mother bids me bind my hair," a touching ditty still familiar. She also wrote the libretto of Haydn's "Creation." Haydn, who speaks of John as "the greatest and most celebrated surgeon in London" (1792), appears to have intensely enjoyed his London visit. His last appearance in Leicester Square was, however, not too pleasant. John Hunter had frequently pressed him to consent to the removal of a nasal polypus which troubled him, but Haydn postponed the appointment from week to week. Learning of Haydn's imminent departure from London, Hunter invited him to come to Leicester Square for urgent but unspecified reasons. "After the first compliments several stout fellows entered, seized me and would have put me on a chair. I shrieked, shouted blue murder and let out lustily with my feet until I freed myself and made Herr Hunter, who stood ready with his instruments, understand that I absolutely refused operation." It may be added that only death parted Haydn from his polypus. It may also be presumed that the reactions of Mrs. Hunter's social evenings upon her husband's practice were usually more favourable. We are told that people were known to have consulted Mr. Hunter professionally in the hope of being invited to Mrs. Hunter's assemblies.

FIG. 5—Mrs. John Hunter.‡

It was doubtless partly for her and her parties and the special coach and coachman he provided for her that her proud and generous husband needed the "damned guineas." Surgeons' wives who envy her should remember that she had a museum in each of her two houses. Her contribution to surgery was John Hunter's happiness. Let us, in recalling her memory as of eighteenth century pot-pourri, also more vividly recall what we owe each of us to his own wife. There should be a special petition in the litany for the women whose domestic routine is daily at the mercy of the acute appendix and the perforated gastric ulcer.

‡ Figs. 2 and 5 are from G. C. Peachey's A Memoir of William and John Hunter, 1924, and fig. 3 is from G. Mather's Two Great Scotsmen, 1893.

Appendix

Abstract of Chancery Proceedings, 1758–1800, C12/1251/68, July 22, 1779: John Hunter, of Jermyn Street, Middlesex, surgeon, *versus* Alexander Gray and John Ogilvie.

"That there being some intimacy of Friendship subsisting between him (the plaintiff) and the Honourable Lockhart Gordon late of Upper Grosvenor Street in the said County of Middlesex Captain in his Majesty's thirty-fifth Regiment of Foot the said Lockhart Gordon informed your orator that having occasion for a Sum of Money he meant to raise the same by way of granting an annuity for his own Life as being the more convenient way for a person in his Situation but that he was apprehensive some further security might be required for securing the payment of such Annuity than his own and desired your orator if necessary to join with him in any reasonable Security which might be required."

"The said Gordon intimated that the Annuity would be about £170 which he would easily keep down out of his pay and that in case he could not procure money in that way it would involve him in some difficulties or distress."

The plaintiff "being desirous under those representations to assist the said Lockhart Gordon as far as he could consistent with his own safety," he agreed to be security.

Shortly afterwards Lockhart Gordon entered into a treaty with Sir Charles Raymond, of Valentines, Essex, Bart., whereby Sir Charles was to pay him £1020 "as a consideration for such Annuity on having the same secured by him and your orator." Therefore the said Gordon and the plaintiff were bound to Sir Charles in £2040 for the payment of an annuity of £170 to Sir Charles during Lockhart Gordon's life. The date of this bond was Nov. 24, 1775.

For the better security of this annuity the said Gordon and the plaintiff delivered to Sir Charles a "warrant of Attorney" of the same date to enable him "to enter up judgment against them upon the said Bonds for the penalty therein contained."

About May, 1778, the payment of the annuity was in arrears "and your orator not having called upon the said Lockhart Gordon for any Indemnity against the same" he applied to Gordon to indemnify him, which he promised to do.

The said Gordon by his deed poll of May 29, 1778, assigned to the plaintiff "all sum or sums of money which was or were then due or which should at any time thereafter become due and payable to him the said Lockhart Gordon for pay or otherwise as a Captain in his Majesty's said thirty-fifth Regiment of Foot or as enjoying any other Rank by Commission which he might thereafter acquire in the Army," unless the arrears of the annuity should be paid within 10 days after the date thereof.

Afterwards Sir Charles Raymond sold the annuity to Sir Richard Chase and gave him the bond and warrant for securing the same.

The annuity being again in arrears, the plaintiff had to pay Sir Richard Chase £240. Afterwards the plaintiff received £45 from Alexander Gray and John Ogilvie of Conduit Street, agents of Lockhart Gordon.

But lately the said Lockhart Gordon, combining with Sir Charles Raymond, Sir Richard Chase, Alexander Gray, and John Ogilvie "to injure and oppress" the plaintiff "and to defeat him of the benefit of his said indemnity," had "privately and without the privity of your orator sold his said Commission with some unfair view or design of throwing the whole weight of the future payments of the said annuity upon your orator."

The money, £1700, received for the commission was paid to Alexander Gray and John Ogilvie. The plaintiff had applied to them and "represented to them the great injury or hardship your orator would sustain in case he should be stripped of his said indemnity by the purchase money for the said commission" being paid to Lockhart Gordon and asked them to have it "laid out in the name of some proper person or persons in some of the publick funds government or other securities," as otherwise the plaintiff would be liable for the annuity and "without some such relief and assistance your orator and his family must be inevitably ruined." The said Gray and John

KEY

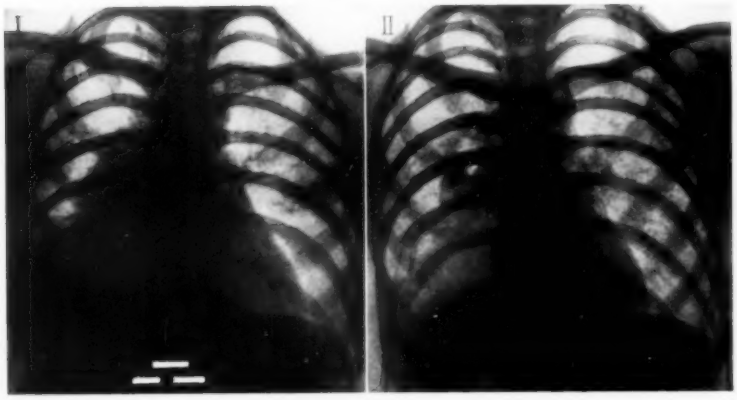
1 Sir Joshua Reynolds
2 Sir William Chambers
3 George Michael Moser
4 Francis Milner Newton
5 Edward Penny
6 Thomas Sandby
7 Samuel Wale
8 William Hunter
9 Francis Hayman
10 Tan Chet Qua (a Chinese artist)
11 George Barret
12 Francesco Bartolozzi
13 Edward Burch
14 Agostino Carlini
15 Charles Catton
16 Mason Chamberlin
17 J. Baptist Capriani
18 Richard Cosway
19 John Gwynn
20 William Hoare
21 Nathaniel Hone
22 Mrs. Angelica Kauffmann
23 Jeremiah Meyer
24 Mrs. Mary Moser
25 Joseph Nollekens
26 John Richards
27 Paul Sandby
28 Dominick Serres
29 Peter Toms
30 William Tyler
31 Benjamin West
32 Richard Wilson
33 Joseph Wilton
34 Richard Yeo
35 Johan Zoffany
36 Francesco Zuccarelli

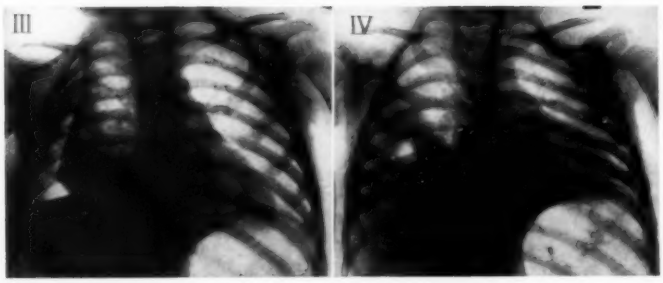
The Life School of the Royal Academy, by J. Zoffany

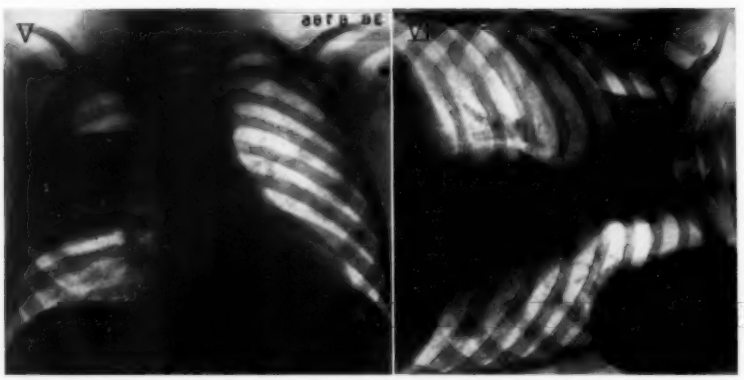
Reproduced from the painting at Windsor Castle by gracious permission of His Majesty the King

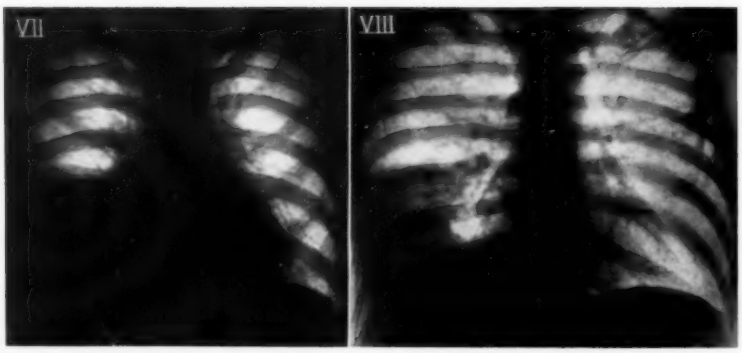
MR. SAMPSON HANDLEY : MAKERS OF JOHN HUNTER

DRS. GARLAND AND BERRIDGE: SUPPURATIVE PNEUMONITIS AND LUNG ABSCESS









DRS. ROBSON & TODD: FIBROCYSTIC DISEASE OF BONE

Ogilvie refused the plaintiff's request and pretended that he was not a security for the said Gordon, or else that he "received some valuable consideration" for it.

Sir Richard Chase "as being sensible of your orator's distressed situation sometimes alledges that he is willing to permit the said annuity to be redeemed" and at other times will not give permission.

(The 35th Regiment of Foot was the Royal Sussex Regiment. Lockhart Gordon joined that regiment from half-pay in 1776 and was still with it in 1779. This regiment went to America in 1775 and fought at Bunker Hill. It took part in the capture of St. Lucia in 1778 and returned to England in 1785.)

SUPPURATIVE PNEUMONITIS AND LUNG ABSCESS

THE VALUE OF RADIOLOGY

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(WITH ILLUSTRATIONS ON PLATE)

CERTAIN cases with the clinical signs and symptoms of lung abscess show a diffuse shadow in the lung parenchyma when examined radiologically. It has been found convenient to call such cases "suppurative pneumonitis." This first stage of pulmonary suppuration has two characteristic radiographic features—namely, homogeneous veiling of the involved region of the lung and increase in the lung markings. The shadowing may involve a whole lobe or only a part of it. If only a part is involved the shadowing is irregular and this is to some degree due to extension of the thickened bronchi beyond the limits of the veiling. Suppurative pneumonitis never produces the true mottled shadowing seen in bronchopneumonia. Bronchial markings are more exaggerated than vascular markings, but the increase in the latter indicates engorgement and stasis such as might be expected in any acute inflammation. The increase in the bronchial markings is characteristically present throughout the course of the disease and is one of the last signs to disappear. The veiling is not usually sufficiently dense to obscure the lung markings completely (fig. I on plate).

If the shadowing persists the second stage may be reached in course of time, when a cavity with a fluid level is demonstrated in the lung parenchyma (fig. II). This is the absolute criterion of lung abscess formation. An intermediate stage may intervene when a circumscribed opacity is observed amidst the shadowing, an opacity which is presumably the locus of a lung abscess.

The cavity of a typical acute lung abscess is surrounded by a uniform opacity of density just insufficient to obscure the lung markings completely. More often than not the cavity is situated towards the upper limits of the veiling. The vomica may be temporarily obscured by a superadded pneumonitis extending beyond the original limits of the disease. Pleural involvement is an almost constant feature of any stage of the disease and it is shown by fluid, pleural thickening or adhesions. This is to be expected in a lesion developing at the lung periphery.

INCIDENCE AND ÆTIOLOGY

Only sixteen cases were seen at a large general hospital in two years, so the condition may be regarded as rare when uncomplicated bronchopneumonia and pulmonary suppuration secondary to such diseases as neoplasm, bronchiectasis and pyæmia are excluded. Suppurative pneumonitis may never progress to a later stage and in six of our cases a cavity was never demonstrated throughout the illness. The main features of the sixteen cases are summarised in the table. The healing time was assessed on clinical grounds but was not considered complete until there was radiological proof that the lung fields were clear. The duration was of necessity prolonged by this rigid criterion.

The series included eleven males and five females. Assuming that oral sepsis is more common in males, it might be argued that this preponderance corroborates the view that dental sepsis is an important ætiological factor (Stern 1936). Moreover, in ten cases the disease was confined to the right lung, and for anatomical reasons septic material finds access easier on that side. Seven cases were associated directly or indirectly with inhalation anæsthesia. Only two of the anæsthetics were for operations in the region of the mouth, one being a dental extraction and the other for a fractured mandible. In eight cases the suppurative pneumonitis followed acute pneumonia and in the remaining case the origin was uncertain.

There is much controversy as to the exact relation between acute pneumonia and pulmonary suppuration. Definite cavities, unassociated with symptoms of lung abscess, have been observed on the radiograms of cases of resolving pneumococcal pneumonia (Kessel 1930). This type of cavitation was found to be due to ischæmic infarction following vascular thrombosis. From this it appears that something more than mere tissue necrosis is required to produce an abscess in acute pneumonia, and the conception of an area of grey hepatisation breaking down into a true abscess is probably incorrect. Every case of pulmonary suppuration must pass through a preceding stage of inflammation. This presuppurative stage, especially in cases of aspiration of septic material, has been termed "pneumonitis." Kerley (1936) has described the radiographic appearances of pneumonitis, which

LEGENDS TO ILLUSTRATIVE PLATE

DRS. GARLAND AND BERRIDGE

I—Suppurative pneumonitis.

II—Same case as fig. I. The condition has now progressed to the formation of an abscess cavity.

III—Empyema cavity.

IV—Same case as fig. III. Empyema cavity simulating abscess cavity.

V—Large abscess cavity in right upper lobe. Erect position.

VI—Same case as fig. V. Fluid level alters its position with the patient lying on one side.

VII—Right middle lobe abscess. Cavity obscured by pleural effusion.

VIII—Same case as fig. VII. Abscess cavity revealed by using a Potter-Bucky grid.

DRS. ROBSON AND TODD

FIG. III—Left femur.

FIG. V—Left hand.

FIG. VI—Right side of thorax, showing affection of fourth and sixth ribs.

Case	Sex	Age (years)	Ætiology	Type	Result	Duration (months)
1	M	17	Postanæsthetic	Abscess, sub-apical, L. lower lobe	Recovered	4
2	M	63	Pneumonia	Abscess, sub-apical, R. lower lobe	Recovered	7
3	F	43	Pneumonia	Abscess, sub-apical, L. lower lobe	Recovered	9½
4	M	3	Pneumonia postanæsthetic (empyema)	Abscess, R. upper lobe	Slight fibrosis. Clinical recovery	1
5	F	25	Bronchopneumonia	Pneumonitis, R. lobes	Recovered	5
6	M	25	Postanæsthetic (fractured mandible)	Abscess, sub-apical, R. lower lobe	Clinical recovery. Complete recovery not confirmed radiologically	2
7	F	15	Pneumonia	Abscess, apical, R. lower lobe	Recovered	6
8	F	39	Pneumonia	Abscess, L. lower lobe	Recovered	3
9	M	19	Pneumonia	Pneumonitis	Bronchiectasis. No recovery after 18 months	—
10	F	9	Postanæsthetic	Pneumonitis, R. lower lobe	Recovered	4½
11	M	7½	Pneumonia	Pneumonitis, sub-apical, R. lower lobe	Recovered	2
12	M	49	Uncertain	Pneumonitis, R. middle lobe	Bronchiectasis. No recovery after 24 months	—
13	M	38	Postanæsthetic (teeth extraction)	Abscess, R. middle lobe	Pleural thickening. Recovered	6
14	M	3½	Pneumonia	Abscess, R. upper lobe	Recovered	3
15	M	35	Postanæsthetic	Pneumonitis, R. middle and lower lobes	Residual fibrosis. Clinical recovery	6
16	M	11	Postanæsthetic	Abscess, L. lung	Died	1

are very different from those of bronchopneumonia, and he has observed that this condition may clear up without proceeding to abscess formation. Suppurative pneumonitis is a stage further, when actual pus is present in the lung but not necessarily in the form of a localised abscess. The true pathology and morbid histology of suppurative pneumonitis are not yet known, and confirmation is required from material obtained at autopsy or from lobectomy before the condition can be finally accepted as a pathological entity. We wish to emphasise that suppurative pneumonitis is quite distinct from the "simple pneumonitis" recently described by Morton Gill (1938).

DIFFERENTIAL DIAGNOSIS

The radiographic appearances of suppurative pneumonitis are not pathognomonic. Pneumonic consolidation, especially in the early stages of resolution, and some forms of influenzal pneumonia can give rise to very similar appearances. Furthermore, it is not possible to determine from the radiogram alone whether suppuration has occurred in an area of pneumonitis. In cases of this kind, however, the clinical signs and symptoms leave no doubt that suppuration is present, and radiological examination is undertaken to determine the extent of the disease and to ascertain whether a definite abscess has formed. Abscess cavities which were not visible on straight radiograms have been demonstrated by tomography, and the introduction of a simplified apparatus by Twining (1937) should lead to the more widespread use of this method. Lipiodol introduced through the bronchoscope directly into the affected part of the lung has also shown cavities which were not apparent on ordinary radiograms (Pinchin and Morlock 1935).

It is the demonstration of a fluid level which usually first draws attention to an abscess cavity, yet from time to time difficulties are encountered in the interpretation of fluid levels in the lung fields. The introduction of air into the pleural cavity following an operation on the ribs or the aspiration of a pleural effusion can give rise to an appearance radiologically indistinguishable from a lung abscess. Figs. III and IV show the development of such an appearance following rib resection for an empyema. A lateral radiogram may show the true state of affairs but even there the resemblance may persist.

Although differential diagnosis from a tuberculous cavity is not usually difficult, the radiographic appearances are sometimes inconclusive. Reliance must then be placed on clinical evidence and especially on the character of the sputum and its bacteriological content. Similarly, confusion may arise when congenital cystic disease of the lung is complicated by pneumonia.

In order to demonstrate a cavity in all its dimensions three radiograms are required: the anteroposterior or posteroanterior projection (fig. V); a lateral view; and one taken in posteroanterior projection with the patient lying on his side in order to reveal the depth of the cavity (fig. VI). A cavity obscured by pneumonitis or by effusion may sometimes be defined by using a Potter-Bucky diaphragm (figs. VII and VIII). Occasionally even in the acute stage of lung abscess physical signs of a cavity are present, and in these circumstances invaluable assistance is afforded thereby. In one of our cases, confirmed radiologically, an abscess in the left lower lobe was associated with cavernous breathing and post-tussic suction.

TREATMENT AND RESULTS

In every case conservative measures were adopted, spontaneous healing being awaited and surgical intervention avoided as far as possible. In only one case was there cause to regret the steadfast adherence to medical treatment. A young adult with suppurative pneumonitis was treated by bronchoscopic aspiration of the pus. He developed bronchiectasis, no recovery

being recorded 18 months after the onset. One case proved fatal; here operation had been regarded as contra-indicated by the surgeons, for the patient was suffering from a series of complications following acute intussusception. Operation was also withheld in a middle-aged man in poor general health and this patient developed bronchiectasis. In one case an incision into an area of suppurative pneumonitis revealed merely a lung oozing pus and no definite abscess cavity. Eleven cases recovered completely, so that there was no cause to be dissatisfied with the immediate results of medical treatment. It was perturbing, however, to find that two cases ultimately developed fibrosis, one presumably being of a permanent type.

The question arises as to what part surgery might have played in shortening the course of the illness, in obviating sequelæ or in saving life. Although the immediate results were good the duration of the illness was usually prolonged and in that way compared unfavourably with the results obtained in some surgical clinics. Children who recover from lung abscess with medical treatment do so quickly and therefore with them the problem of operation is not so important. In adults the position is less satisfactory. Neuhoff and Touroff (1938), with their wide experience of abscess of the lung, now do not favour deferring operation when the progress of a case is doubtful. The series of cases published by them shows what can be accomplished by early operation with specialised technique.

Operation in the early stage of suppurative pneumonitis may reveal an abscess, but on the other hand it may reveal only a lung oozing pus—a condition that has been aptly compared with a bog in contrast to the pool of a frank lung abscess. At this stage too, resolution may occur and it may not be possible to demonstrate an abscess cavity throughout the course of the disease. Having decided to operate on such a case the surgeon may be confronted with the difficult task of performing lobectomy. Complications, including extensive adhesions, may render lobectomy too dangerous to undertake (Chandler 1938), and in consequence the patient has to combat not only suppurative pneumonitis but also the effects of operation and a chest wound. It appears that one is only on firm ground in advocating operation when there is radiological evidence of an abscess cavity. Progressive enlargement of the vomica represents an absolute indication for operative treatment. Surgical treatment should be discussed when serial radiograms show an abscess cavity persisting for a fortnight or more. Operation becomes imperative when the patient's general state is deteriorating or when there is a danger that the condition is becoming chronic. An empyema complicating any stage of the disease is, of course, always treated surgically.

SUMMARY

1. Sixteen cases of suppurative pneumonitis are discussed, ten of which proceeded to lung abscess.

2. The distinction between the two conditions rests largely on radiological grounds.

3. It is maintained that by distinguishing the stage in the disease a basis is obtained upon which to found the operative indications.

We wish to thank Dr. Edward Miles, medical superintendent of Oldchurch County Hospital, for permission to publish these cases, and Dr. W. Burton Wood for his criticism and advice.

(*References at foot of next column*)

FIBROCYSTIC DISEASE OF BONE

WITH SKIN PIGMENTATION AND ENDOCRINE DYSFUNCTION

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(WITH ILLUSTRATIONS ON PLATE)

SINCE Mandl (1926) demonstrated a relationship between disturbance of the endocrine system and the diffuse fibrocystic disease of bone of von Recklinghausen much attention has been paid to the recognition of these cases and to the benefit to be derived from parathyroidectomy. In 1929 Aub summarised his extensive work on calcium and phosphorus metabolism; and studies of fibrocystic disease as a whole and of individual cases have since been published in this country particularly by Hunter (1930 and 1931–32). Diffuse cystic changes in the skeleton clearly present a complex problem and only a proportion of the cases are suitable for parathyroidectomy. Wilder and Howell (1936) in a review of 135 proven cases give the following as the invariable features of this latter group:

(1) The skeletal appearances are those of cystic osteitis fibrosa.

(2) There must be indisputable abnormality of calcium metabolism demonstrated by a study of the blood or urine.

(3) There must be tumorous enlargement of one or more parathyroids.

Gutman and his colleagues (1936) suggest that evidence of disturbed calcium metabolism may not always accompany even true fibrocystic disease of the skeleton associated with parathyroid tumour. These workers point out that a normal blood-calcium figure may be found in such cases in the presence of renal failure, that from experimental evidence variations in calcium intake may possibly be of importance, and that the disease may be subject to spontaneous remissions. There is no doubt that a condition of the skeleton radiographically very similar to that associated with a parathyroid tumour does occur in its absence. This is referred to by Hunter (1931–32) as the "multiple focal type of fibrocystic disease" and also by Fairbank (1935).

Albright and others (1937) have described a syndrome characterised by osteitis fibrosa disseminata, areas of pigmentation, and endocrine dysfunction with precocious puberty in females. In none of their patients did a parathyroid tumour appear to be present, and the following case, which came under our observation, conforms to their description.

(*Continued from previous column*)

DRS. GARLAND AND BERRIDGE: REFERENCES

Chandler, F. G. (1938) *Clin. J.* **67**, 185.
Gill, A. M. (1938) *Brit. med. J.* **1**, 504.
Kerley, P. (1936) Recent Advances in Radiology (2nd ed.).
Kessel, L. (1930) *Arch. intern. Med.* **45**, 401.
Neuhoff, H., and Touroff, A. S. W. (1938) *Surg. Gynec. Obstet.* **66**, 852.
Pinchin, A. J. S., and Morlock, H. V. (1935) *Lancet*, **1**, 1369.
Stern, L. (1936) *J. thorac. Surg.* **6**, 202.
Twining, E. W. (1937) *Brit. J. Radiol.* **10**, 332.

CASE-REPORT

A woman aged 33, a brush-factory worker and former shop-assistant, was admitted to the neurological ward of the Middlesex Hospital in November, 1937, under the care of Dr. McAlpine. Her parents were unrelated and three sisters were free of cutaneous pigmentation and gave normal menstrual histories. As far as the patient was aware there had been nothing abnormal about her until the age of 4, when she was noticed to be growing unusually big for her years. At the age of 6 the breasts began to develop, pubic hair appeared and a year later menstruation set in. This was often excessive in the early years and on one occasion there was continuous loss for nearly six months. About this time (her sixth year) she was noticed to be limping with her left foot. Something abnormal was observed in the region of the left hip and she was admitted to the local hospital, where a radiogram was taken and an exploratory operation performed. The results of these investigations are not known. In 1911, at the age of 7, she fractured the left humerus, in 1914 the left femur, in 1916 the upper end of the left tibia and since 1916 she has sustained two further fractures of the left humerus and three of the left femur. The most recent fracture was of the left humerus in 1935, when she was treated at York County Hospital (fig. II). Several determinations of blood-calcium and blood-phosphorus done at this time gave normal figures. (We are indebted to Mr. A. H. C. Visick for this information.) She was referred to Dr. McAlpine on account of a complete right facial palsy which had appeared in August, 1935, following the extraction of a lower molar tooth under local anæsthesia and had persisted. A left facial palsy appeared suddenly on April 9, 1938, and the patient was readmitted for a short time in June, 1938. As far as was known the patient had always taken a normal full diet.

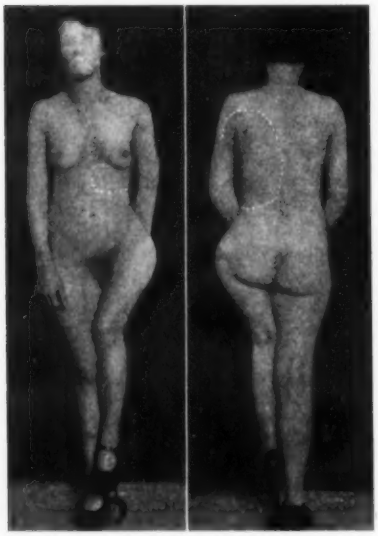

FIG. I—Front and back views of patient. The pigmented area has been outlined with a dotted line.

On examination there was a complete right facial palsy, also a left facial palsy which was showing signs of recovery. There was gross deformity of the left arm and forearm, left side of the pelvis and left leg (fig. I). In order to get about she had to wear a nine-inch iron on the left foot. There was a brownish pigmentation on the left side of the back and chest and under the left arm (fig. I). This was strictly unilateral and had been present since birth as far as the patient knew. The blood-pressure was 130/80 mm. No abnormality of the pelvic organs could be detected clinically (Mr. F. W. Roques).

INVESTIGATIONS

Wassermann reaction: negative.
Blood-count: normal in all respects.
Blood chemistry:

Urea	24	mg. per 100 c.cm.
Non-protein nitrogen	27	mg. ,,
Albumin	3·28	g. ,,
Globulin	2·48	g. ,,
Fibrinogen	0·45	g. ,,
Calcium	10·1	mg. ,,
Phosphorus	3·4	mg. ,,
Plasma phosphatase (normal range 3–11 units)	11·4	units ,,
Sodium	327	mg. ,,
Potassium	21	mg. ,,
Chlorides	590	mg. ,,

The blood-calcium and blood-phosphorus were substantially the same on three separate occasions, including one reading during menstruation.

Van Slyke's urea-clearance test: normal.
Urine: normal.
Aschheim-Zondek test: negative.
Calcium balance:

	Ca. intake	P. intake	Ca. output	P. output
First observation (six days)	0·58 g.	2·77 g.	1·94 g.	3·4 g.
Second observation (three days)	0·25 g.	1·39 g.	0·83 g.	1·84 g.

These figures indicate a slight but definite negative calcium balance (Dr. J. D. Robertson).

Reports on radiography of bones (Dr. T. V. Crichlow): "Fibrocystic disease in left humerus and lower extremity (fig. III on plate) with old healed fracture in lower end of humerus and femur. Left side of pelvis shows fibrocystic changes (fig. IV); the left hand (fig. V on plate) left foot, the right fourth and sixth ribs (fig. VI on plate) also show changes, also the right transverse process of the third lumbar vertebra and the right side of the sacrum. Scoliosis in the lumbar vertebræ. No cystic changes seen in the skull, the two translucent areas being probably pacchionian bodies." No abnormalities were detected in special views of the skull in the region of the facial canals. There was no evidence of renal calculus. The pituitary fossa was normal. No peripheral arterial calcification was visible.

Exploration of neck: On Jan. 20, 1938, Mr. Gordon Taylor did an exploratory operation in the neck but no tumour was found in the region of the parathyroid glands nor elsewhere in the neck, nor as far as could be discovered was there a tumour in the substernal region. No further exploration was undertaken in view of the inconclusive biochemical findings.

The radiographic and biochemical investigations were repeated when the patient was readmitted in June, 1938, and the results were substantially the same. There appeared to have been no radiological

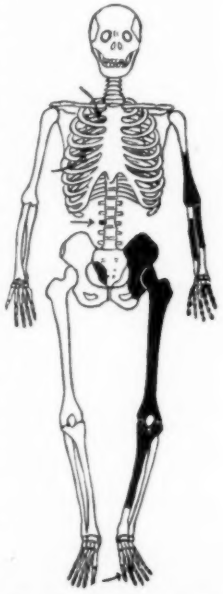

FIG. II—Distribution of the bone lesions.

FIG. IV—The pelvis.

advance of the condition in the intervening seven months. The only difference to clinical examination was the presence (already mentioned) of the left sided facial palsy.

Albright and others (1937) record personal observations on five cases and report six somewhat similar cases from the literature (see table). They were also able to find four recorded cases in males; though pigmentation was present in three of these, none showed precocious puberty. In a later communication Albright, Scoville, and Sulkovitch (1938) describe two more male cases (personally observed) with pigmentation and fibrocystic disease of bones but without precocious puberty, and they quote a third case. The literature contains at least one further male case in this group, described by Hirsch (1929). Albright postulates that the whole syndrome may be due to a "disseminated neurological lesion." McCune and Bruch (1937) say that the clinical and pathologic relationship of the condition in males to that described in females is speculative.

DISCUSSION

Of the cases in general we would point out the relative normality of calcium metabolism, that there is a tendency for the bone lesions to be mainly unilateral and for there to be a partial correspondence between the distribution of the skin pigmentation and the bone lesions. These points are stressed by Albright and others in their paper. The radiographic

SUMMARY OF CASES OBSERVED AND COLLECTED BY VARIOUS AUTHORS

Authorities	Sex	Age in years— At onset of bony symptoms	At onset of menstruation	At appearance of secondary sexual characters	Pigmentation	Bones affected	Laboratory findings	Biopsy	Exploration of neck	Remarks
Albright and others (1937) (1)	F	8	7	12	Yes	Right side; left scapula, humerus, radius	Blood-calc. and phosph., phosphatase, and calc. balance normal	Osteitis fibrosa	Not done	—
Albright and others (1937) (2)	F	10	1	Not stated	Yes	Right pelvis and leg	Blood-calc. and phosph., and phosphatase normal	Osteitis fibrosa	Not done	—
Albright and others (1937) (3)	F	3½	? 4½ mths.*	¼	Yes	Widespread both sides	Ditto	Osteitis fibrosa	Not done	Explored for suprarenal tumour, none found. Mentally retarded.
Albright and others (1937) (4)	F	?8	3½	Early	Yes	Right-sided except skull where mostly left-sided	Ditto	Osteitis fibrosa	Not done	—
Albright and others (1937) (5)	M	4	—	12	Yes	Widespread both sides	Blood-calc. and phosph. normal, phosphatase increased	Osteitis fibrosa	Yes; no tumour found	—
Weil (1922)	F	1½	1½	Not stated	Yes	Not stated	Not stated	None	Not done	At age 9 had secondary sex characters of a child of 15.
Gaupp (1932) (1)	F	2	3	? 2	Yes	Bilateral	Blood-calc. and calc. in urine normal	Osteitis fibrosa	Yes; no tumour	—
Gaupp (1932) (2)	F	2	9	9	Not mentioned	Bilateral	Blood-calc. and calc. balance normal	Osteodystrophy	Yes; no tumour	First fracture at 6 years.
Stalman (1933)	F	5	¾	Not stated	Yes	Bilateral	Not stated	None	Not done	At age 8 had pubic hair and breasts developed.
Snapper and Parisel (1933)	F	7	7	7	Yes	Bilateral	Blood-calc. 12·6 mg.	? xanthomatosis	Yes, twice; no tumour	Described as diffuse xanthomatosis. Subsequently developed ? sarcoma of left hip. Mentally retarded.
Goldhamer (1934)	F	3	2	Not stated	Yes	Left-sided	Blood-calc. once 12·0 mg.	Osteitis fibrosa	Not done	—
McCune and Bruch (1937)	F	2	2	4	Yes	Bilateral; right more than left	Phosphatase increased	Osteitis fibrosa	Yes; no tumour	Hyperthyroidism. Basal metabolic rate + 65 per cent.

* Some bleeding took place at 4½ months, menstruation established at 5 years.

appearances of the skeleton, at least in advanced cases, are indistinguishable from those seen in other types of fibrocystic disease of bone.

It is possible that these cases may be examples of hyperparathyroidism observed in a quiescent phase, but the bizarre association of the bone changes with cutaneous pigmentation in both sexes and precocious puberty in females (developing at the time when bone softening first gives rise to symptoms) points to the condition being a specific entity. Possibly also the male cases should be regarded as distinct from the female in that precocious puberty does not occur. In none of the cases (six in all, with five female) in which the neck was explored was a parathyroid tumour discovered. Of particular interest in our patient was the bilateral facial palsy, but we are unable to suggest any connexion between this and the other features of the case.

SUMMARY

A case of fibrocystic disease of bone is described in a woman of 33 in whom extensive bony changes were associated with premature puberty and cutaneous pigmentation. A summary is given of twelve similar cases reported elsewhere, eleven of whom were women. It is suggested that the condition is a clinical entity.

We wish to thank Dr. McAlpine, Mr. Gordon Taylor, and Dr. Beaumont (under whose care the patient came in at various times) for allowing us to publish the case; Prof. Dodds for much help and advice and the use of the biochemical data; and Prof. McIntosh and Dr. Graham Hodgson for the assistance afforded by their departments.

REFERENCES

Albright, F., Butler, A. M., Hampton, A. O., and Smith, P. (1937) *New Engl. J. Med.* **216**, 727.
— Scoville, B., and Sulkovitch, H. W. (1938) *Endocrinology*, **22**, 411.
Aub, J. C. (1928–29) Harvey Lect., p. 151.
Fairbank, H. A. T. (1935) *Proc. R. Soc. Med.* **28**, 1611.
Gaupp, V. (1932) *Mschr. Kinderheilk.* **53**, 312.
Goldhamer, K. (1934) *Fortschr. Rontgenstr.* **49**, 456.
Gutman, A. B., Tyson, T. L., and Gutman, E. B. (1936) *Arch. intern. Med.* **57**, 379.
Hirsch, I. S. (1929) *Radiology*, **13**, 44.
Hunter, D. (1930) *Lancet*, **1**, 897, 947, and 999.
— (1931–32) *Brit. J. Surg.* **19**, 203.
Mandl, F. (1926) *Zbl. Chir.* **53**, 260.
McCune, D. J., and Bruch, H. (1937) *Amer. J. Dis. Child.* **54**, 806.
Snapper, I., and Parisel, Ch. (1933) *Quart. J. Med.* **2**, 407.
Stalman, A. (1933) *Virchows Arch.* **289**, 96.
Weil, T. (1922) *Klin. Wschr.* **1**, 2114.
Wilder, R. M., and Howell, L. P. (1936) *J. Amer. med. Ass.* **1**, 427.

"... we are able to discern a kind of nature-mind spectrum; for there appears a roughly given hierarchy of five ascending levels—mathematical, physical, biological, psychological and social. Each level has its appropriate special language. The basic corresponding concepts are respectively: *number* at the mathematical level; *matter* at the physical level; *organism* at the biological level; *mind* at the psychological level; and *society* at the social level. If we choose to select one of these as somehow more real than the others, a great distortion arises in our point of view. For example, if we regard the physical level as the most fundamental, we become materialists. But why make such an unnecessary choice? ... we have come to realize that our only approach to a better understanding of the world is by means of a widening succession of abstract ideas, each explaining imperfectly some aspect of the stupendous whole."—GEORGE D. BIRKHOFF, *Science*, Dec. 30, 1938, p. 601; *Nature, Lond.* Jan. 14, 1939, Suppl. p. 60.

TREATMENT OF PNEUMONIA WITH 2-(*p*-AMINOBENZENESULPHONAMIDO) PYRIDINE (M. & B. 693)

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(Concluded from p. 317)

Randfontein Estates Ltd. Hospital

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This hospital serves a population of 20,000 native miners. Each native is thoroughly inoculated prophylactically with pneumonia vaccine within three weeks of beginning work. The incidence and mortality-rate from pneumonia in recent years has been relatively low, and the interesting feature on this mine is that cases of pneumonia due to pneumococcus types present in the vaccine occur but rarely. It seems that immunologically the vaccine has been effective in its purpose (Lister and Ordman 1935).

There were 57 adult native male patients in the control series and 58 in the series treated with M. & B. 693. There was 1 death in each series. On the basis of case-mortality rate it is impossible to evaluate the therapeutic use of the drug in pneumonia. But, on the other hand, table I shows that the drug has been effective in reducing the period of pyrexia and the total period of stay in hospital. The action of the drug is very noticeable, the temperature reaching the normal by crisis on the second or third day. The pulse-rate falls to normal ten to twelve hours after the temperature. With the fall of temperature and pulse-rate the general condition is remarkably improved—much more so than after a natural crisis.

Several cases on admission were clinically diagnosed as pneumonia and given the drug, crepitations with soft tubular breathing and scanty rusty sputum being observed. These cases were subsequently excluded from the experiment, because the lobar pneumonia was not confirmed radiographically. It is quite possible that in these cases consolidation of the lung was inhibited by the drug.

An average of 19–22 *g.* of the drug was given to each case in the treated series. On admission the patient was given 4 tablets repeated in four hours, then 2 tablets every four hours for forty-eight hours, then 1 tablet four-hourly for forty-eight hours. It is quite possible that equally good results could be obtained with smaller doses.

Every case was radiographed with portable apparatus, and, if any doubt existed as to the presence of lobar pneumonia, radiography was repeated in twenty-four or forty-eight hours. No doubtful cases were included in the experiment. The Wassermann reaction of the blood of every patient was tested. There was a strongly positive reaction in 10 of the control cases and 8 of the treated cases. In the treated series 4 other cases gave a doubtful Wassermann reaction.

The usual routine treatment for lobar pneumonia was given to all cases—i.e., continuous administration of oxygen by nasal tube, ice-bag to præcordia, intravenous saline and glucose in very toxic cases, and stimulants when indicated. Specimens of sputum were submitted to the South African Institute for Medical Research for bacteriological investigation as soon as the diagnosis of lobar pneumonia was made but before the first dose of the drug had been administered.

Table I shows that, from the point of view of age-groups, tribal distribution, and physical signs, the population in the series of control and treated cases were experimentally comparable. Similarly, the period of illness before admission to hospital is approximately the same in both series and is between one and two days.

The total number of days in hospital with pyrexia in the control series averaged 7·8 as against 2·8 in the treated series. Further, 87·6 per cent. of the treated cases showed a normal temperature on the third day in hospital, whereas in the control series the corresponding figure is only 7·2 per cent. The duration of stay in hospital was 16·6 days in the treated series and 24 days in the control series.

No serous effusions or empyemas were encountered in either series. Antipneumococcal serum was not administered. Vaccine treatment in hospital was given in about half the cases in each series, when 3 c.cm. of the institute's pneumonia (compound) vaccine was administered on three occasions at daily intervals (1 c.cm. in each dose).

The following is a note on the fatal case in the treated series:—

CASE 22704.—Native. Right-upper-lobe and left-lower-lobe pneumonia, type XIX. Very ill on admission. Confirmed by radiography. Died on fifth day in hospital.

Post mortem pneumococcus type XIX and *Staphylococcus aureus* were isolated from the lung.

CONCLUSIONS

In this group of cases M. & B. 693 was effective in reducing the period of pyrexia and the total period of stay of natives in hospital.

Witwatersrand Native Labour Association Hospital

DR. A. I. GIRDWOOD
SENIOR MEDICAL OFFICER

Patients admitted to this hospital are derived from the adjoining compound, in which are temporarily housed those natives who have just arrived on the Witwatersrand after previous medical examination and are ready after a further medical examination for distribution to the various mines to which they have been allocated. Similarly, in this compound there arrive for a few days' sojourn those natives who have completed their mine contract or for reasons of illness have been repatriated by the mine. This means that patients in the hospital are derived from a variety of sources and include natives without previous mining experience, with mining experience of varying duration, and healthy and debilitated or otherwise unfit natives.

Table I shows that 24 natives are included in the experiment—all adult males. The majority were newly arrived "tropical" natives from Nyasaland who had en route received one prophylactic inoculation against pneumonia. It is well known locally that "tropical" natives—those derived from Northern Rhodesia and beyond—are more susceptible to pneumonia than are the natives from the Union of South Africa.

It has been difficult to assess the period of illness before admission to hospital, but, generally speaking, since the compound natives are under close supervision, admission to hospital can be taken to have occurred within a day, or at most two days, of the onset of the illness.

The diagnosis was not confirmed radiographically, but diagnosis of pneumonia was not made until definite signs of consolidation appeared. It is for this reason that the number of days in hospital, before the drug was administered, was on an average 2·2, the bulk of the patients receiving their first dose on the second or third day. The pyrexial period after the administration of the drug was one day only in 44 per cent. of the cases, two days in 22 per cent., three days in 17 per cent., four days in 13 per cent., and five days in 4 per cent. This gives an average of 4·3 days per case in hospital with pyrexia. There were nearly twice as many cases of pneumonia terminating by crisis as by lysis in this treated series. Table I shows that the average number of days' stay in hospital per case was 24·4.

The amount of M. & B. 693 given was usually 2 tablets four-hourly for forty-eight hours, then occasionally 1 tablet four-hourly for twenty-four hours. It seems that this dosage, which averaged 14·2 g. per case, was rather on the low side, particularly in the early stages of the illness, and may account for the comparatively long detention in hospital of the pneumonia patients. Toxic symptoms with the drug were not observed except in one case in which there was vomiting. Pneumonia vaccine 1 c.cm. was administered in four cases in hospital. Serum was not given in any of the cases.

The following is a summary of the fatal case:—

A Nyasa native, aged 26, was admitted with pneumonia showing consolidation of the right middle and lower lobes. There was obvious jaundice. Three days elapsed before the diagnosis became clear and thus before the drug was administered. The pyrexia lasted three days followed by a normal period of two days, with a temperature again for three days, when death occurred. This patient had received 15 g. of the drug. There was much drowsiness at the completion of the treatment.

Post mortem there was a consolidation of the right-middle and upper portion of the lower lobes. All the organs were bile-stained. Unfortunately neither the sputum in this case nor the lungs at autopsy were submitted for bacteriological investigation. The reason why the case was not amenable to the drug is not clear, but it is to be noted that the patient was severely ill with jaundice on admission.

CONCLUSION

Although there are no controls in this group of cases, I am satisfied that M. & B. 693 has been effective in appreciably reducing the duration of pyrexia in pneumonia in natives, especially "tropical" natives, in whom pneumonia is generally a severe disease.

Bacteriology, Mortality, and Defervescence

DR. ORDMAN

At the outset of the experiment it was arranged that a specimen of sputum be submitted to the South African Institute for Medical Research for bacteriological investigation from each case of pneumonia in the control and treated series from the various hospitals. The specimen was taken as soon as the diagnosis of pneumonia was clinically

TABLE II—BACTERIOLOGICAL ANALYSIS OF THE PNEUMONIA CASES IN THE EXPERIMENT

Organisms recovered		City Deep Ltd.				Randfontein Estates Ltd.				W.N.L.A.		Johannesburg Hospital								Total cases		Total Deaths	
												Non-Europeans				Europeans							
Type of pneumococcus	Other†	Controls		Treated		Controls		Treated		Treated		Controls		Treated		Controls		Treated		Controls	Treated	Controls	Treated
		C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D				
1	—	1	..	..	..	3	..	2	..	..	..	15	2	14	1	9	3	3	..	37	26	7	2
	H	1	..	..	..	1	..	..	..	..	..	2	1	1	..	1	..	..	..				
	F	..	..	1	..	..	..	1	..	..	..	2	..	2	..	..	..	1	..				
	HF	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	1	..	..				
	A	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1				
2	—	2	..	1	..	..	..	..	..	1	..	7	3	8	..	..	..	2	..	12	18	3	1
	H	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..				
	F	..	..	1	..	..	..	..	..	..	..	..	..	2	..	1	..	..	..				
	FA	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..				
	HFA	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..				
3	—	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	1	2	5	—	1
	H	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..				
4	—	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	2	1	1	—
	F	..	..	..	..	..	..	..	..	1	..	1	..	..	..	..	..	..	..				
5	—	..	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	—	6	—	—
	F	..	..	1	..	..	..	1	..	..	..	..	..	1	..	..	..	..	..				
6	—	..	..	1	..	1	..	1	..	1	..	..	..	..	..	..	..	..	..	1	4	—	—
	F	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..				
7	—	3	1	2	..	2	..	1	..	1	..	4	..	3	..	..	..	..	..	10	15	1	—
	H	..	..	..	..	..	..	..	..	1	..	..	..	2	..	..	..	..	..				
	F	..	..	2	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..				
	HF	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..				
8	—	1	1	1	..	..	..	..	..	..	..	3	..	1	..	..	..	..	..	6	3	1	—
	H	..	..	..	..	2	..	..	..	1	..	..	..	..	..	..	..	..	..				
9	—	5	..	..	..	2	..	..	..	..	..	1	..	..	..	..	..	..	..	10	2	1	—
	H	..	..	..	..	1	1	1	..	..	..	..	..	..	..	..	..	..	..				
	HF	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..				
	F	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..				
10	—	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	—	—
	HF	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..				
11	—	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	2	—	—	—
12	—	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	3	1	—	1
	F	..	..	..	..	..	..	..	..	..	..	2	..	1	1	..	..	..	..				
15	—	..	..	2	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	—	3	—	—
17	—	..	..	..	..	..	..	1	..	..	..	2	..	1	..	..	..	..	..	3	2	—	—
	H	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..				
18	—	..	..	..	..	..	..	..	..	..	..	2	1	..	..	..	..	..	..	2	—	1	—
19	—	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	—	4	—	1
	H	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..				
	F	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..				
	A	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..				
20	F	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	—	—	—
21	—	..	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	—	3	—	—
23	—	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	—	1	—	—
25	—	2	..	4	..	..	..	4	..	..	..	2	..	..	..	..	..	..	..	6	8	—	—
	F	..	..	..	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..				
27	—	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	—	1	—	—
32	—	..	..	..	..	1	..	..	..	..	..	1	..	1	..	..	..	..	..	3	2	—	—
	F	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..				
	H	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..				
"T"*	—	1	..	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	2	1	—	—
Unclassified	—	4	..	7	..	4	..	2	..	1	..	1	..	1	..	2	..	2	..	17	19	—	—
	H	..	..	..	..	1	..	1	..	..	..	2	..	..	..	..	..	..	..				
	F	..	..	2	..	2	..	3	..	..	..	..	..	..	..	..	..	..	..				
	HF	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..				
	HA	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..				
Not recovered	—	21	1	9	..	18	..	14	..	12	..	8	..	11	1	2	..	6	..	71	97	1	2
	H	2	..	8	..	5	..	9	..	..	..	2	..	1	..	1	..	..	..				
	F	2	..	6	..	1	..	3	..	1	..	3	..	4	..	1	..	1	..				
	HF	2	..	..	..	..	..	2	..	..	..	..	..	1	..	..	..	1	..				
	HA	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..				
	A	..	..	1	..	..	..	1	..	..	..	..	..	2	1	..	..	..	..				
	HFr	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..				
	Fr	1	..	..	..	1	..	1	..	..	..	..	..	..	..	..	..	1	..				
Not examined	..	45	1	46	..	6	..	1	..	3	1	18	8	6	1	9	2	2	..	78	58	11	2
Totals ..	..	100	4	100	0	57	1	58	1	24	1	86	16	71	6	27	6	27	2	270	280	27	10

* Type "T" = A South African type of the pneumococcus not represented in the American (Cooper) classification (Ordman 1938).
† H = Hæmolytic streptococcus; HF = *H. streptococcus* and *H. influenzæ*; HFA = *H. streptococcus*, *H. influenzæ*, and *Staphylococcus aureus*; F = *H. influenzæ*; A = *Staphylococcus aureus*; Fr = Bacillus of Friedländer. C = cases; D = deaths.

established, and in the treated series just before the administration of the first dose of the drug.

In the laboratory the sputum was cultured on blood-agar medium and in broth for 18–24 hours in the incubator at 98·4° F. The colonies found were subsequently examined and studied in detail when necessary. In almost every instance the *M. catarrhalis* and non-hæmolytic streptococcus were found. The pneumococcus, hæmolytic streptococcus, *H. influenzæ*, Friedländer's bacillus, *Staphylococcus aureus*, diphtheroid bacilli, and coliform bacilli were recovered in different specimens. In table II and in the remarks that follow relating to the experiment record has been made only of the pneumococcus, hæmolytic streptococcus, *Staphylococcus aureus*, and Friedländer's bacillus—organisms considered to be significant from previous experience of local cases of pneumonia.

The typing of the pneumococcus was carried out by the *Quellung* method of Neufeld. In the earlier part of the experimental period this test was done on the sputum as received, but shortly after the experiment was begun the *Quellung* test was performed on the sputum concentrated as to the organisms present by the method of Taplin, Meneely, and Hettig (1938). It seemed clear from confirmatory experimental observations carried out in this laboratory that this concentration method was of greater value in sputum typing than the method of direct typing in that the possibility of missing pneumococci occurring in scanty numbers was much diminished.

Although a pneumococcus type could be determined by the *Quellung* method on the concentrated sputum, it did not necessarily follow that a pneumococcus would be recovered on cultivation of the specimen. In all cases in which the pneumococcus was recovered from culture from the specimens of sputum received it was separately typed, and in every case the type found corresponded to that obtained by the *Quellung* test on the original sputum. Frequent mouse-inoculation confirmatory tests were carried out when necessary.

Table II summarises the bacteriological findings in the control and treated cases of the various groups.

An analysis has been made of the bacteriological findings in every specimen of sputum received during the experimental period. Although 582 specimens were originally submitted for bacteriological examination, 168 were cancelled from the series, for the corresponding cases were subsequently discarded from the experiment as not being true cases of pneumonia. There were 550 cases of pneumonia in the experiment: 270 controls and 280 treated cases. Of these 550 cases 414 (75·3 per cent.) were bacteriologically studied.

Table II shows that in the control series 15 of the 27 fatal cases were distributed as follows:—

Type I	7	Type VIII ..	1
,, II	3	,, IX ..	1
,, IV	1	,, XVIII ..	1
,, VII	1		

In 1 instance the pneumococcus was not recovered. In 11 fatal cases no bacteriological specimens had been submitted for bacteriological examination.

Of the 10 fatal cases in the treated series 6 were distributed as follows:—

Type I	2	Type XII ..	1
,, II	1	,, XIX ..	1
,, III	1		

In 2 instances the pneumococcus was not recovered and in 2 fatal cases specimens were not examined.

From this it appears that M. & B. 693 did not prevent the deaths in 2 out of 26 cases of type-I infection, in 1 out of 16 cases of type-II, in 1 out of 5 cases of type-III, in a single case of type-XII, in 1 out of 4 cases of type-XIX, and in 2 out of 95 cases in which the pneumococcus was not recovered. Two fatal cases had escaped bacteriological study.

Fleming (1938) has shown that the action of M. & B. 693 against the pneumococcus is enhanced by the presence of the specific antibodies of this organism. Indeed, he has advocated the use of anti-pneumococcus serum along with the drug in the treatment of pneumonia. A study on these lines was not carried out during the course of this experiment. But it is of importance to note the results of the group experiments among the natives on Randfontein Estates Ltd. as compared with those of natives admitted to the Non-European Hospital, Johannesburg. In the latter the mortality-rate in the control group was 18·6 per cent., whereas that of the treated group was 8·5 per cent. A very similar case-mortality rate obtained in the European patients of the Johannesburg Hospital (see table I). In the treated cases on the Randfontein Estates the case-mortality rate was 1·7 per cent. The question arises why the natives in the treated group on the Randfontein Estates showed so low a mortality-rate. Three explanations suggest themselves as factors in this question: (1) in the non-mining natives there is a longer period before admission to hospital, (2) Randfontein Estates native miners are primarily a medically selected group of adult males of a certain age-group, and (3) the Randfontein Estates native miners have been previously prophylactically inoculated with a polyvalent pneumococcus vaccine. It is impossible at this stage to be certain which factor or, possibly, combination of factors is important.

If the group of mining natives prophylactically inoculated is compared with that of the non-mining natives, regarding the period of pyrexia in hospital in the control and treated group, certain differences can be noted (table III).

TABLE III—COMPARISON OF DURATION OF PYREXIA IN PROPHYLACTICALLY INOCULATED MINE NATIVE AND NON-MINING NATIVE PNEUMONIA PATIENTS

—	Percentage of cases showing a normal temperature within four days of admission to hospital	
	Control	Treated
Randfontein Estates Ltd. (prophylactically inoculated)	12·6	92·9
Non-European Hospital (not inoculated)	38·5	60·0

The natives on the Randfontein Estates are all thoroughly inoculated with the pneumonia prophylactic vaccine as used on the mines of the Witwatersrand, whereas the native patients admitted to the Non-European Hospital are not inoculated. It must also, however, be realised that any helpful active immunity due to the vaccine (comprised of but a few groups) could apply to only a certain number of the Randfontein cases—that is, if we are to maintain our views regarding group specificity in pneumonia immunisation—and further, although *Streptococcus hæmolyticus* is also a constituent of the vaccine, the immunity response to this organism is still in doubt. The fact that the Non-European Hospital cases in greater numbers show a termination of their pyrexia within four days in the control group may simply reflect the fact that on account of the greater delay

before their admission to hospital a portion of the natural pyrexial period in pneumonia has occurred before their admission as hospital patients. On the other hand, it is very striking that in the treated group the inoculated mine has practically 93 per cent. of its patients normal within three days, whereas in the Non-European Hospital only 60 per cent. of the patients returned to normal temperature within four days after admission.

The total days in hospital with pyrexia of natives in the control group on the Randfontein Estates is 7·4, whereas the corresponding figure for the control natives in the Non-European Hospital is 5·6. The latter figure is somewhat lower, possibly because of the longer period that elapsed before admission to hospital. If the corresponding figures in the treated groups are compared, on the inoculated mine (Randfontein Estates), the stay of the natives in hospital before termination of pyrexia is on an average 2·8 days, and of the non-inoculated general native population 4·8 days, notwithstanding the fact that, as shown above, a portion of their pyrexial period occurred before their admission. Further studies on these lines are necessary before any definite conclusions can be drawn.

General Summary and Conclusions

(1) An experiment was carried out in Johannesburg on various population groups to investigate the therapeutic value of M. & B. 693 in pneumonia.

(2) In native miners no significant difference was observed in the mortality-rates between the control and treated series of the groups, but a significant difference was observed in favour of the use of the drug, as regards the duration of pyrexia and detention in hospital and the improved clinical condition of the patients.

(3) In the pneumonia patients, both natives and Europeans, of a general hospital (Johannesburg Hospital) the mortality-rates in the treated series were markedly reduced.

(4) Bacteriological studies showed that M. & B. 693 was used in the treatment of pneumococcus types I–X, XV, XVII, XIX, XXI, XXIII, XXV, XXVII, XXXII, "T," and various "unclassified" types, as well as in cases of pneumonia in which the pneumococcus was not present.

(5) The influence of active immunisation on the action of M. & B. 693 is briefly discussed.

(6) From the experiment it is clear that M. & B. 693 is a valuable drug for the effective treatment of pneumonia both in Europeans and in natives.

REFERENCES

Evans, G. M., and Gaisford, W. F. (1938) *Lancet*, **2**, 14.
Fabraeus, R. (1921) *Acta med. scand.* **55**, 3.
Fleming, A. (1938) *Lancet*, **2**, 74.
Lister, S., and Ordman, D. (1935) *Publ. S. Afr. Inst. med. Res.* **7**, 1.
Ordman, D. (1938) *Ibid*, **9**, 1.
Taplin, G. V., Meneely, G. R., and Hettig, R. A. (1938) *J. Amer. med. Ass.* **111**, 410.
Whitby, L. E. H. (1938) *Lancet*, **1**, 1210.

KATHERINE BISHOP HARMAN PRIZE.—The British Medical Association invite medical practitioners registered in the British Empire to submit essays for this prize not later than Dec. 31. The prize was founded in 1926 to encourage "study and research directed to the diminution and avoidance of the risks to health and life that are apt to arise in pregnancy and child-bearing," and competitors may select the work they wish to present, provided it falls within this definition. Further information may be had from the secretary of the association, B.M.A. House, Tavistock Square, London, W.C.1.

THE USE OF STORED BLOOD FOR TRANSFUSION

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DURING the recent international crisis conditions were anticipated in which large numbers of emergency blood-transfusions might be necessary. To meet this need simple apparatus was devised for the collection, storage, and administration of blood withdrawn from healthy people. The value of conserved blood has been established by extensive experience, especially in Russia (Skundina 1933, Filatov 1937, Yudin 1936 and 1937, and Bagdassarov 1937), Spain (Duran-Jorda 1937 and Saxton 1937) and the United States (Fantus 1937 and Goodall 1938), but precise technical details of the methods used are not available. It appeared therefore that a summary of the results observed in the collection, storage, and administration of fifty lots of blood might be of value.

COLLECTION OF BLOOD FROM DONORS

The apparatus (fig. 1) consists of a litre bottle graduated at 100 c.cm. intervals to 1000 c.cm., a rubber bung pierced by two glass tubes neither of which extends more than an inch into the bottle, and rubber tubing 2 in. long attached to the upper end of one of the glass tubes, into which is let a short glass connecting piece 2 in. from the end attached to the glass tube. To the distal end of the rubber tube is attached a Keynes or other large needle, which is enclosed in a test-tube sealed with a cotton-wool collar. The other glass tube is plugged with cotton-wool. 500 c.cm. of preserving fluid, the formula of which is described in a subsequent paragraph, is introduced into the bottle. A paper cover is fixed with an elastic band over the neck of the bottle, a spring clip is clamped on the rubber tube just short of the Keynes needle to prevent condensed moisture from rusting the needle, the test-tube containing the needle is slipped under a rubber band encircling the bottle, and the outfit is autoclaved. After autoclaving, a small dry test-tube to receive blood for the Wassermann reaction and a tube containing 2 c.cm. of a solution of 1 per cent. sodium citrate in normal saline for a sample of the blood to be used for grouping and cross-matching are slipped under the band, completing the outfit.

The bleeding is carried out under strictly aseptic conditions, the antecubital fossa being thoroughly cleaned with soap and alcohol. A sphygmomanometer cuff round the upper arm is pumped to a pressure of 80 mm. Hg, 0·25 c.cm. of a 2 per cent. solution of procaine is injected intradermally over a suitable vein, and the Keynes or other large-bore venepuncture needle is inserted into the vein. The bottle receiving the blood is held as far below the arm as the length of the rubber tubing will allow and is gently agitated to ensure thorough mixing of blood and preservative. A rapid flow is desirable, for a poor flow predisposes to clotting in the stored blood. The withdrawal of 500 c.cm. of blood should take not longer than four to seven minutes. As soon as

500 c.cm. of blood has been collected, the spring clip is clamped over the rubber tubing between the bung and glass connecting piece, and the end of the longer rubber tubing is removed from the latter. Two drops of blood from the detached end of the rubber tubing are run into the pilot tube for grouping and cross-matching and a few c.cm. into the dry tube for the Wassermann reaction before the needle is withdrawn from the vein.

The blood-group is determined and the bottle labelled with donor's name, group, and date of bleeding. The results of the sterility test and Wassermann reaction are entered on the label later. The pilot tube remains attached to the apparatus for cross-matching at the time of the transfusion. The blood is then stored at 4° C. The following day a few c.cm. are withdrawn for the sterility test.

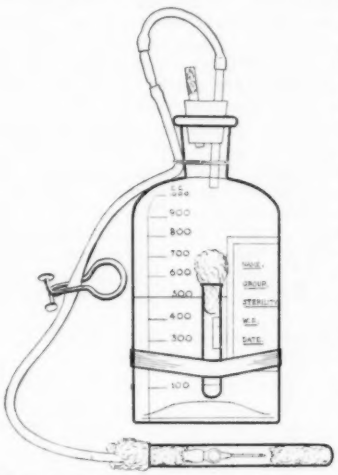

FIG. 1—Apparatus for collection of stored blood.

Originally, blood from the donor was run into the bottle through a long glass tube extending to within ¼ in. of the bottom of the bottle. Through this same tube the blood was withdrawn, at the time of the transfusion, with a suction and pressure apparatus. This long tube, however, predisposed to clotting even if washed through with citrate solution after the bleeding and was therefore discarded.

THE PRESERVATIVE

The preservative used at first was 10 c.cm. of a 3·8 per cent. solution of sodium citrate for every 90 c.cm. of blood. The bottles were autoclaved containing 50 c.cm. of citrate solution, 450 c.cm. of blood being added. Twenty lots of blood were conserved in this way for six to fifteen days before use, and one lot for thirty-three days. It was found that clots formed in twelve of the twenty-one cases, and hæmolysis of varying degree occurred in over a half. Although transfusion with such blood did not in our experience increase the incidence of reactions, it was clearly desirable to use a preservative which maintained the stored blood in better condition. The solution (Bagdassarov 1937) of the Institute of Hæmatology and Blood-Transfusion, Moscow, was therefore tried and has proved satisfactory. Known as I.H.T. its formula is: sodium chloride 7 g., sodium citrate 5 g., potassium chloride 0·2 g., magnesium sulphate 0·04 g., distilled water to 1000 c.cm. It is mixed volume for volume with blood.

STORAGE

All the blood collected and used in this series was stored at 4° C. Experimental observations with small amounts of blood showed that complete hæmolysis occurred if the blood was allowed to freeze. The period of storage before use varied from one to thirty-three days, the usual being six to fifteen days. Changes were observed in the appearance of the blood as the period of storage lengthened. With I.H.T. preservative, the plasma above the layer of sedimented red cells remained clear up to the tenth or twelfth day, occasionally up to the twentieth day. A zone of hæmolysis appeared after this period and gradually increased in intensity. Samples of blood stored for a slightly shorter period showed a slight degree of hæmolysis when the blood was centrifuged after it had been shaken up and warmed for use. The significance of these various grades of hæmolysis in relation to biological value of the blood is discussed later. With citrate preservative, hæmolysis was apparent at an earlier stage. These findings conform to those of other workers, Bagdassarov (1937) noting hæmolysis with I.H.T. about the fifteenth or sixteenth day, and Kovtunovich (1933) rather sooner, about the eighth day.

The fragility of the red cells in the stored blood was not investigated. This has been shown to increase from the fifth or sixth day, the cells becoming more and more fragile to hypotonic saline up to the fifteenth day, when spontaneous hæmolysis is apparent (Bagdassarov 1937, Balachowsky 1932).

It appears possible that the agglutinability of the red cells may be reduced by storage. In three cases after a period of storage from six to fifteen days agglutination by high-titre serum could be seen microscopically only. The significance of this observation requires further investigation.

STERILITY

The method employed in testing for sterility was as follows. Four tubes containing heart broth were inoculated with fresh blood, two with 2 c.cm. and two with 1 c.cm., one from each set being incubated aerobically at 37° C. and the other two anaerobically. Cultures were plated out daily for fourteen days. Three cases of contamination with *Staphylococcus aureus* occurred in the first 20 of the 50 samples collected. The remaining 30 were sterile. It is possible that this high rate of contamination was in part due to technical factors which were later eliminated. The contaminant usually grew in about half the tubes, not developing until the sixth day. This delay in the appearance of the contaminant suggests that it may be necessary to keep the cultures under observation for at least a week before reporting a negative. One positive Wassermann reaction was found in the series.

SOURCE OF BLOOD

The original supply of blood consisted of eleven lots obtained from volunteers during the period of emergency. Subsequently the relations of patients receiving blood always proved willing to make up any blood used and often were glad to donate an extra supply, thus providing for emergency transfusion given to patients with no relations available. Therapeutic venesection also provided a limited amount.

METHODS OF ADMINISTRATION

The conserved blood was administered in three ways: by a pressure apparatus devised to suit the containers in which blood was collected, by gravity, and by Marriott and Kekwick's continuous-drip apparatus.

The pressure apparatus is illustrated in fig. 2. A 50 c.cm. Record syringe is attached to a two-way cock. One distal limb of the two-way cock is

connected with rubber tubing 5 in. long to a Record needle adaptor. Into this rubber tube is inserted a glass connecting piece. The other distal limb of the two-way cock is connected to rubber tubing 24 in. long into which is inserted a glass bulb 1¼ in. in diameter and partially filled with glass-wool. The glass-wool is thoroughly washed after insertion into the bulb. The apparatus, except the syringe, is wrapped in lint and paper and autoclaved. The syringe is sterilised by boiling and allowed to dry, being lubricated with sterile olive oil immediately before use.

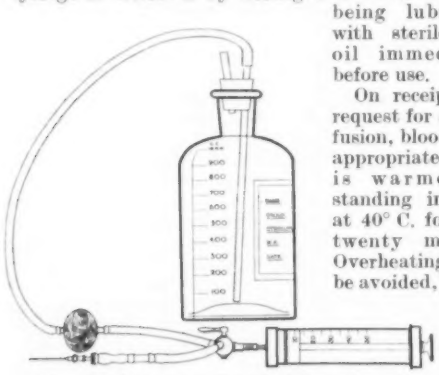

FIG. 2—Apparatus for administration of stored blood.

On receipt of a request for a transfusion, blood of the appropriate group is warmed by standing in water at 40° C. for about twenty minutes. Overheating is to be avoided, and the blood should be used as soon as it is at the correct temperature. During this time the donor's cells from the pilot tube are cross-matched with the recipient's serum, macroscopic and microscopic tests being done. At the bedside, the paper covering the neck of the container is removed, and the bung already in the bottle is replaced by a bung pierced by a long and a short glass tube (fig. 2), the long glass tube reaching to the bottom of the bottle. Originally this bung was inserted at the time of the sterility test, but it has been found that during the period of conservation clots tend to form on the long glass tube. To the upper end of the long tube is attached the distal end of the longer section of rubber tubing of the apparatus.

The apparatus is filled with blood, and air-bubbles are excluded, by holding the syringe vertically at the full length of the rubber tube above the container. Blood is sucked up through the filter into the syringe to about the 20 c.cm. mark. The syringe now contains blood and the air from the dead space of the apparatus. The air is expelled by inverting the syringe, holding the rubber tubing to which is attached the needle adaptor vertically above the syringe, adjusting the stopcock, and expelling all the air through the needle adaptor. By setting the stopcock at the midway position, both limbs of the cock are closed, and the apparatus can be set down while the tourniquet is being applied. If the needle is to be inserted into the vein while attached to the apparatus, it is necessary to suck back sterile saline through the needle until clear saline shows at the glass connecting piece as a means of indicating that the needle is in the vein. The needle can, of course, be introduced attached to a syringe and then fixed to the apparatus. The blood is administered by suction and pressure, the two-way cock directing the flow of blood. If necessary, small-bore needles can be used, thus reducing to a minimum the incidence of cutting down on the vein. The whole operation can be carried out by a single person, the time between receiving the request for an emergency transfusion and its completion being about forty-five minutes, if the patient's serum is available for cross-matching, and an extra fifteen minutes if the patient's serum has to be prepared.

When the gravity technique or the continuous drip is used, the stored blood must first be filtered through muslin, for a teaspoonful or two of fine fibrin clot is often present even with I.H.T. preservative.

RESULTS OF TRANSFUSION WITH STORED BLOOD

Fifty lots of stored blood have been administered to patients suffering from a variety of conditions. Mild transfusion reactions have occurred, and therapeutic results have varied. Improvements in storage technique and experience with blood conserved for various periods indicate that stored blood can well satisfy the therapeutic requirements of transfusion.

Therapeutic results.—Conditions treated included postoperative shock, acute loss of blood, anæmia from chronic recurrent hæmorrhage, anæmia of chronic sepsis, pregnancy, and chronic nephritis, and a variety of blood diseases. Five patients with postoperative shock and two with postpartum hæmorrhage were transfused at the request of the surgeons concerned. The pulse and temperature responded as favourably as to transfusion with fresh

TABLE I—CASES IMPROVED, WITH BLOOD-COUNTS

Case	Conditions of stored blood: Period in days	Preservative	Hæmolysis	Volume of blood (c.cm.)	Indications for transfusion	Reactions	Increase in red cells and hæmoglobin: Red cells (mil/c.mm.)	Hæmoglobin (% Hb.)
8	7	I.H.T.	0	400	Anæmia of chronic nephritis	R	0·6	10
11	3	I.H.T.	0	400	Chronic anæmia from recurrent bleeding from gastric ulcer	—	0·2	12
12 (*a*)	13	C.	++	450	? Aplastic anæmia	T	0·2	6
(*b*)	13	C.	++	400				
14 (*a*)	5	I.H.T.	0	400	Ditto	—	0·3	15
(*b*)	11	C.	0	400				
16	8	C.	+	550	Anæmia of chronic sepsis	—	..	4
*18 (*a*)	6	C.	+	450	Ditto	—	2·0	44
(*b*)	1	I.H.T.	0	400				
22	4	I.H.T.	0	400	Anæmia with carcinoma of rectum	R	0·5	8
26 (*a*)	10	I.H.T.	+	400	Pregnancy anæmia	T	1·1	24
(*b*)	10	I.H.T.	+	400				
(*c*)	6	I.H.T.	0	500				
3	8	C.	+	550	Preoperative preparation	—	..	8
27 (*a*)	9	I.H.T.	+	500	Anæmia following postpartum hæmorrhage	T	1·6	44
(*b*)	19	I.H.T.	+	300				
(*c*)	19	I.H.T.	+	400				
28 (*a*)	20	I.H.T.	++	400	Pregnancy anæmia	—	0	12
(*b*)	16	I.H.T.	+	400				
(*c*)	6	I.H.T.	0	500				
29 (*a*)	20	I.H.T.	++	500	Anæmia following hæmorrhage	—	1·0	16
(*b*)	10	I.H.T.	+	450				
30 (*a*)	8	I.H.T.	0	250	Anæmia with uterine fibroids	R	..	16
(*b*)	10	I.H.T.	0	500				

* 1200 c.cm. fresh blood also given. T = temperature; R = rigor. I.H.T. = preservative solution used at the Institute of Hæmatology and Blood-Transfusion, Moscow (sodium chloride 7 g., sodium citrate 5 g., potassium chloride 0·2 g., magnesium sulphate 0·04 g., and distilled water to 1000 c.cm.). C = citrate.

TABLE II—CASES UNIMPROVED, WITH BLOOD-COUNTS

Case	Conditions of stored blood: Period in days	Preservative	Hæmolysis	Amount of transfusion (c.cm.)	Indications for transfusion	Reactions	Change in red-cell and hæmoglobin levels: Red cells (mil./c.mm.)	Hæmoglobin (Haldane %)
4	7	C.	+	250	Pregnancy anæmia	T	−0·1	− 2
9	4	I.H.T.	0	400	Hæmatemesis	—	+0·4	0
13	8	C.	0	400	? Aplastic anæmia	—	−0·5*	−11*
15 (*a*)	8	I.H.T.	0	400	Ditto	R	+0·1	+ 2
(*b*)	6	I.H.T.	0	400				
17	15	C.	+	500	Anæmia of chronic sepsis	—	−0·3†	− 4†
19 (*a*)	15	C.	++	400	Leuco-erythroblastic anæmia with bone metastases	—	0	− 2
(*b*)	8	C.	+	300				
20 (*a*)	13	C.	+	300	As case 19	—	0	0
(*b*)	6	C.	0	500				
24	33	C.	+++	500	Malignant cachetic anæmia	—	0	0

* 4 days after transfusion. † 2 days after transfusion.

blood. Blood-counts were not done in these cases, on account of the difficulty of evaluating their significance in dehydrated states.

Tables I and II show the effect on the red-cell counts and hæmoglobin in various conditions: table I when there was an increase and table II when there was no increase. The amount of each transfusion is tabulated in terms of volume of undiluted blood. The poor results in two of the thirteen cases in table I (cases 12 and 28) followed transfusion with blood which would now be regarded as unsuitable for clinical use, on account of the degree of hæmolysis in the stored blood.

Of the cases in table II, in which no improvement results, case 9 was vomiting blood and lost 10 oz. during the transfusion; cases 19 and 20 had severe and ultimately fatal purpuric hæmorrhage from mucosæ; the blood used in case 24 was thirty-three days old and grossly hæmolysed; and in case 15 disturbing factors unrelated to the use of stored blood were present. In case 4 the transfusion was abandoned owing to technical difficulties after 250 c.cm of blood had been given. The cases in table II, with two exceptions, were transfused with blood preserved with citrate during the early stages of this investigation when the technique of storage was still undeveloped.

Other cases not improved by transfusion and not included in tables I and II were one of carcinoma of the stomach with hæmatemesis, moribund at the time of transfusion; one of acute leukæmia which proved fatal two days later; and one of fatal acute hæmorrhage to whom 1200 c.cm. of stored blood was given while the hæmorrhage remained uncontrolled.

Transfusion reactions.—Rigor followed transfusion in four cases and a rise of temperature in four. Technical factors due to inexperience with stored blood, which have now been eliminated, probably accounted for four of the reactions. Faint jaundice followed two continuous-drip transfusions in which the therapeutic results were good. Hæmoglobinuria was not observed in any cases. The incidence of reactions did not appear to be related to duration of storage, slight degrees of hæmolysis, or the presence of clots in the stored blood. Rigors occurred with blood four to ten days old, temperatures with blood six to nineteen days old, and no reactions with blood one to thirty-three days old. No conclusions can be drawn as to the relative incidence of reactions with citrate and I.H.T.

CONCLUSIONS

The preceding observations indicate that blood stored at 4° C. with I.H.T. should satisfy the following standards before being used:—

(i) The period of storage should not exceed ten to fourteen days if the best results are to be obtained. Filatov (1937) advises a shorter period if blood has to be transported.

(ii) Hæmolysis should be absent when the blood is inspected for fitness as it stands in the cold room. The grade of hæmolysis which becomes apparent only with centrifugalisation of the blood after it has been shaken up and warmed does not appear to affect demonstrably the biological value of the blood. Grosser grades, visible as a zone of red plasma above the layer of sedimented red cells in the blood while standing in storage, are not harmful but reduce the value of the blood.

(iii) Clots in stored blood, although undesirable, are not a contra-indication to its clinical use, provided all such blood is filtered before use.

(iv) The sterility and Wassermann tests must be negative.

Particular care is required in recording the blood-groups at the time of bleeding. Clerical errors may occur when several donors are bled at the same time. Cross-matching at the time of the transfusion must be a routine, and, when more than one lot of stored blood is given in one transfusion, each lot must be re-grouped besides being cross-matched.

SUMMARY

(1) Simple apparatus for the collection, storage, and administration of conserved blood is described.

(2) Experience with fifty lots of such blood shows that most satisfactory results are obtained when blood is collected into I.H.T. and kept for not longer than ten days, though blood stored for longer periods has been given with satisfactory results.

(3) Reactions are not more likely to occur with properly conserved blood than with fresh blood.

(4) Therapeutic effects of stored blood which satisfies certain conditions described are comparable with those of fresh blood.

Our thanks are due to the Hon. T. C. Stamp for investigating the sterility of the blood collected, to the technical staff for help in preparation of the apparatus, and to the Chief Medical Officer of the London County Council for permission to publish these results.

REFERENCES

Bagdassarov, A. (1937) *Sang*, **11**, 466.
Balachowsky, S., et al. (1932) *Sorr. probl. perelit. krovi gematol.* **3–4**, 16 (abstr. *Int. Abstr. Surg.* 1934, **58**, 68).
Duran-Jorda, F., et al. (1937) *Rev. Sanid. Guerra*, **1**, 329.
Fantus, B. (1937) *J. Amer. med. Ass.* **109**, 128.
Filatov, A. N. (1937) *Vĕstn. Khir.* **51**, 194 (abstr. *Int. Abstr. Surg.* 1938, **66**, 500).
Goodall, J. R., et al. (1938) *Surg. Gynec. Obstet.* **66**, 176.
Kovtunovich, G. (1933) *Sovetsk vrac. Gaz.* **1–2**, 21 (abstr. *Int. Abstr. Surg.* 1934, **58**, 453).
Saxton, R. S. (1937) *Lancet*, **2**, 606.
Skundina, M. (1933) *Nov. chir. Arch.* **29**, 248 (abstr. *Int. Abstr. Surg.* 1934, **59**, 547).
Yudin, S. S. (1936) *J. Amer. med. Ass.* **106**, 997.
— (1937) *Lancet*, **2**, 361.

COLLECTION AND TRANSFUSION OF PRESERVED BLOOD

AN IMPROVED TECHNIQUE

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It is not the purpose of this report to adduce any further evidence of the value of preserved blood for transfusion. Reports from the Moscow Institute of Hæmatology, from the transfusion services of the forces in the Spanish war, and from various clinics on the Continent and in America leave little doubt that preserved blood is highly satisfactory therapeutically and well suited to circumstances of emergency.

Our interest in the subject was aroused by a communication of Goodall and his associates (1938) on the preservation of fœtal blood obtained from placentas, and received an impetus from the preparations made at the Mile End Hospital during the recent international crisis. We wish to report certain observations on the bacteriological aspects of blood preservation which led to the development of a method of collecting blood that reduces the risk of contamination to a minimum. The procedure is simple and efficient and seems very suitable for use in war conditions.

POSSIBILITIES OF CONTAMINATION

In the course of their article Goodall et al. make the following statements:—

(*a*) "Cultures of the preserved blood are unnecessary because, at the low temperature for preservation, contamination, if present, could not propagate, and consequently would be so attenuated as to be innocuous."

(*b*) "In the many transfusions with fetal blood there has not been one untoward reaction, nor a single rise of temperature, even to a fraction of a degree, attributable to the transfusion."

Grodberg and Carey (1938), describing 75 transfusions of placental blood given at the Boston City Hospital, also lay stress on the absence of complications. They assumed the bacteriological cleanliness of preserved blood from the sterility of a small sample taken at the time that the placenta is drained, no cultures being made at the end of the period of preservation.

Our early experiences with bacteriological control were disquieting. A total of 40 specimens of fœtal blood, collected according to the technique described by Goodall, were cultured after twenty-one days' preservation at a temperature of 4°–7° C. We found that about 30 per cent. were contaminated with staphylococci, *B. coli* or *Str. fæcalis*, in that order of frequency. The appearance of a specimen of blood could not be relied upon as an indication of the presence or absence of contamination. We do not think that the examination of a small specimen at the time of collection (as relied upon by Grodberg and Carey) gives a useful indication of the bacterial content of the bulk of the blood, or that the low temperature of preservation is an insurance against propagation if contamination has occurred.

It appears certain that many transfusions of placental, donor and cadaver blood containing living organisms have been given without harm, and even with benefit, to the recipient. It is comforting to know that this margin of safety exists for any intravenous infusion and that it is probably quite wide. This does not, however, remove the obligation to reduce the risk of contamination to a minimum, especially when blood is to be stored before use, and it seems clear that the method described by Goodall and most other methods are deficient in this respect.

METHOD OF COLLECTION

As a consequence of these findings we have devised a technique which is equally suitable for the collection of adult and placental blood. This method is completely closed and makes use of the efficient vacuum which is present in the various screw-cap containers supplied by the Southern Group Laboratory to the hospitals of the London County Council. The method of general preparation of these containers has been described by McCartney (1935). Dr. McCartney has now standardised the technical details of preparation so as to ensure that this vacuum is constant and adequate. This is done by autoclaving the bottles with the screw-caps loose and tightening them immediately the autoclave is opened. The vacuum so produced is sufficient nearly to fill the bottles with fluid. The rubber diaphragm used is 3 mm. thick and a $\frac{1}{4}$ in. hole is punched in the metal screw-cap to allow a needle to be inserted through the rubber. We add about 40 c.cm. of glass shot (diameter 2–3 mm.) to each bottle before autoclaving.

Preservative solution.—We have used the preservative known as "I.H.T. fluid," evolved at the Moscow Institute of Hæmatology, for which the following formula has been given by Balachovski and Guinsbourg (1934): sodium chloride, 7·00 g.; sodium citrate, 5·20 g.; potassium chloride, 0·20 g.; magnesium sulphate, 0·04 g.; water (redistilled) to 1000 c.cm. This fluid has given satisfactory results when mixed with an equal quantity of blood. It should be noted, however, that it contains a comparatively small amount of sodium citrate and that if preserved blood be mixed with a fluid, such as gum-saline, which contains calcium, coagulation may occur. (Goodall's instructions for the preparation of preservative fluid are misleading; they result in a solution which is five times too dilute and therefore hæmolyses blood and fails to prevent coagulation.)

I.H.T. fluid should be used when blood is to be stored for more than a few days. In war conditions, when the storage period would probably be very short, it would be permissible to employ a 3·8 per cent. sodium-citrate solution.

Collection of blood from an adult donor.—Two sizes of vacuum bottle have been used: a 600 c.cm. bottle containing 200 c.cm. of I.H.T. fluid and a 1200 c.cm. bottle containing 400 c.cm. The amount of blood required for transfusion is variable and wastage can be avoided by use of the smaller bottles, three of which may readily be filled at a single venepuncture. At the time of collection blood is also drawn into two small tubes; one of these contains I.H.T. fluid and is used for grouping and direct matching, the other being used to collect blood for the Wassermann test. A label is attached to the collecting bottle in such a position that its upper edge, when the bottle is inverted, indicates the level to

which the blood should be collected. The apparatus required is:—

Vacuum bottles (600 c.cm. or 1200 c.cm.) containing I.H.T. fluid (200 c.cm. or 400 c.cm. respectively).

5 c.cm. vacuum bottle containing 2 c.cm. I.H.T. fluid (for grouping).

Dry tube (for Wassermann reaction).

Two short-bevelled, olive-mounted, internally polished intravenous needles, bore 15/10, one 5 cm., the other 10 cm. long, attached at either end of a 9 in. length of rubber tubing. (These are dry-sterilised, the needle-points being protected in glass tubes.)

Local anæsthetic, syringe, sphygmomanometer, &c.

It is desirable that the vein selected should be of reasonable size. Any vessel into which a French's

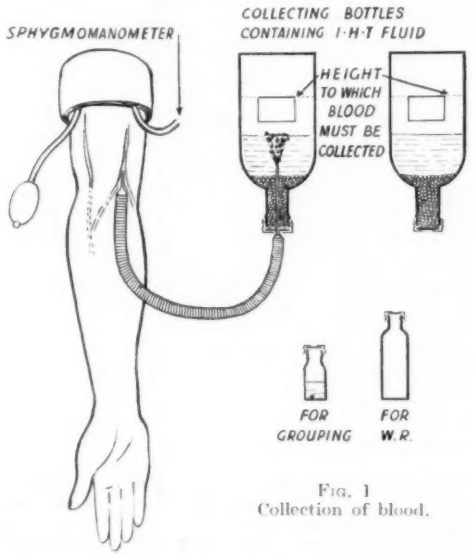

FIG. 1
Collection of blood.

needle could be inserted, and many which would be rather small for this, may be used without difficulty. Small veins may give trouble because of the tendency of their walls to collapse on to the point of the needle when the flow of blood is insufficient to supply the demands of the vacuum.

A little local anæsthetic is injected intradermally and the short collecting needle is inserted into the vein. As soon as the blood flows the long distal needle is pushed through the sterile rubber diaphragm (and the shot) of the first collecting bottle where it is retained until the required amount of blood has been drawn in. It is then transferred to the succeeding collecting bottles and finally to the two small containers. The vacuum bottles should be inverted during collection and the blood then issues directly into the preservative fluid which promotes mixing, prevents frothing, and minimises hæmolysis and clot formation (fig. 1). The needle should pierce the rubber diaphragm vertically to avoid air leakage, which may account for the occasional contaminations which occur. These needles are smaller than French's needle (and are consequently easier to handle) but the flow of blood is so rapid that trouble with clotting during collection has never been encountered. All those who have used this method of collecting blood are unanimous in their appreciation of its simplicity and efficiency.

Collection of placental blood.—For collecting placental blood smaller bottles containing 125 c.cm. of I.H.T. fluid have been used. The tissues of the umbilical cord are delicate and leakage of air round the needle should be prevented by applying pressure at the site of puncture, either with the fingers or preferably with a rubber-covered clamp. It may be necessary to rotate the needle occasionally during collection to disengage it from the wall of the vein, but in most cases the procedure is easy. At this hospital a Wassermann test is performed upon every mother and therefore need not be performed on the placental blood.

After collection all blood is cleansed from the surface of the bottle-caps and the bottles are then marked with the date and source of collection, fastened together and placed in the refrigerator (4°–7° C.). The blood in the small container is grouped and a distinctive coloured label indicating the group is attached to each bottle. The store of blood is inspected periodically and any specimens in which deterioration is evident are discarded. The period at which this has been necessary has varied from three to six weeks and, as a further contribution to the bacteriological control, all such specimens have been cultured aerobically and anaerobically before being thrown away.

AMOUNT AND STERILITY OF BLOOD OBTAINED

As a source of supply *placental blood* has not fulfilled our expectations. The average yield has been less than 100 c.cm. and does not justify the expenditure of time on the part of the medical staff. We recently entrusted the collection to the maternity nursing staff, but the results of the bacteriological examination of specimens collected by them have so far proved unsatisfactory. Some placentas contain only a very small amount of blood, which is discarded at once, but many specimens of 100–120 c.cm. can be obtained and might be worth preservation as auxiliaries to a store of blood. The blood is easily grouped, keeps well, and may be transfused with the same results as blood from adult donors.

Of the first 24 specimens that we collected by the improved method only 1 was found to be contaminated when cultured fifteen days after collection. This grew two colonies of *Staphylococcus albus*. These results represent a considerable advance upon those we obtained using Goodall's technique of collection.

Adult blood.—In all, 40 specimens of adult blood were cultured after periods of preservation varying from twenty-one to forty-two days. Before culture these specimens were incubated at 37·5° C. for twenty-four hours to encourage the growth of any organisms which might be present. Of the 40 specimens 38 were found to be sterile and the remaining 2 each grew a few colonies of *Staphylococcus albus*. (In the case of one of these considerable air leakage was noted during collection and we now discard any such specimen.) Varying degrees of hæmolysis occur during storage, depending on the lapse of time and on the amount of violence to which the blood is subjected during and after collection. Some specimens exhibit a surface layer of fat which may simulate a bacterial pellicle. Small clots appear occasionally; the reasons for their formation require further investigation but we have not discarded any blood because of their presence.

METHOD OF TRANSFUSION

Preserved blood may be transfused by any of the methods in common use. We prefer to give it directly from the bottles in which it has been stored, without warming, through a drip-feed regulated to deliver about 60 drops per minute. Filtration is necessary

to exclude small clots which might obstruct the needles and the glass shot have proved adequate for this. After trial of several different methods the following technique has been adopted.

The transfusion tube is assembled as illustrated (fig. 2). The needles are both size 15/10. The drip-feed may be of any pattern but the volume of space below the nipple should be greater than half the capacity of the whole bulb. To minimise "dead space" rubber tubing of small bore (5/32 in. bore 1/20 in. wall) is used and the length of that part above the drip-feed should not be more than three inches. All joints should be airtight.

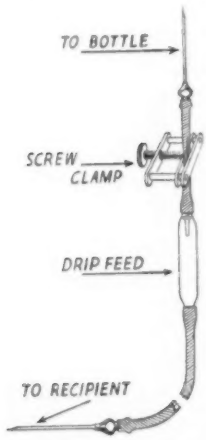

FIG. 2 — Transfusion tube assembly.

Before transfusion the vacuum in the first container is replaced by filtered air through a needle. When the air has reached atmospheric pressure a rubber bellows or Higginson syringe is attached to the air filter and three or four blasts are given so as to introduce a slightly positive pressure. The needle is then removed, the container inverted and suspended in a wire cradle. With the screw-clamp closed, the proximal needle of the transfusion tube is inserted through the rubber diaphragm just into the mass of shot which have fallen into the neck of the bottle. The distal needle is then elevated so that the drip-feed occupies a horizontal position, the clamp is opened and the blood allowed to fill the transfusion tube slowly (fig. 3). As soon as blood issues from the distal needle all air will have been expelled from the system except that in the upper half of the horizontal

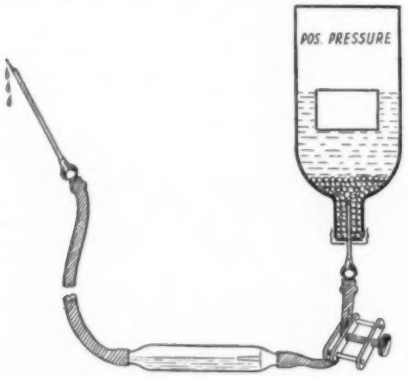

FIG. 3—Filling of transfusion tube drip-feed horizontal.

drip-feed and the distal needle may then be lowered and introduced into the recipient's vein. The transfusion proceeds for a few moments until the positive pressure in the container has been exhausted. When the flow has become very slow a needle with an air filter is reinserted to act as air inlet and the transfusion then proceeds by gravity. We have observed that if both needle-points are buried in the shot air occasionally finds its way into the exit needle. The inlet needle should therefore be long enough for its point to reach above the shot and its tube should be compressed with the fingers until it has reached this position (fig. 4).

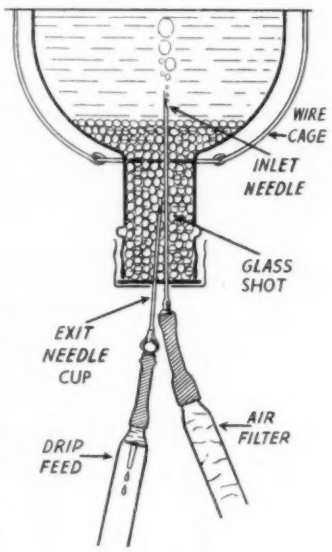

FIG. 4 — Showing relationship of needles to filter.

The change-over to the second and subsequent bottles is effected by closing the screw clamp and transferring the two needles, the inlet needle being inserted first to remove the vacuum. (No positive pressure is required in the second or subsequent bottles as the transfusion tube is now full of blood and exerts sufficient suction to start the flow.) The rubber diaphragm withstands repeated puncture without leakage.

THE USE OF STORED BLOOD FOR TRANSFUSION

Our experience of the use of stored blood is not yet sufficiently extensive to indicate that it is free from disadvantages. We have given 38 transfusions of adult and placental blood after periods of preservation ranging from two to six weeks. One patient had a reaction of sufficient severity to terminate the transfusion, two others had rigors during the administration, and another developed an urticarial eruption two days after the transfusion. In other respects the results have been satisfactory. These reactions occurred when the blood used for transfusion consisted of a mixture of adult and placental or of several placental specimens. On each occasion the recipient's serum had been matched against the cells of each specimen separately. No reactions were seen when adult blood only was used even when it came from more than one source. We have had the satisfaction of saving one life in circumstances of such urgency that the need to find a donor would have entailed fatal delay and we have been able to supply the needs of other hospitals on several occasions. The maintenance of a supply of preserved blood of all groups for a single hospital is wasteful because the demand is not sufficient to absorb the supply. This disadvantage can be overcome by the organisation of a central "blood bank" for a group of hospitals, each depositing an equal volume of blood in exchange for the amount withdrawn. Even then the demand must be large and constant, to turn over the supply before deterioration occurs. The presence of a small store of group O blood to meet cases of extreme urgency seems to us to be desirable at any hospital. Some form of blood storage organisation would be essential in war-time and our methods appear capable of development to meet this need.

SUMMARY

(1) An account is given of bacteriological investigations indicating the frequency with which preserved blood is contaminated.

(2) A description is given of a simple and efficient technique of collection and storage which has been found greatly to reduce the incidence of contamination.

(3) A technique of transfusion appropriate to this method of collection is described.

(4) Some of the practical aspects of blood preservation are considered.

We are indebted to Sir Frederick Menzies for permission to publish this report. We also wish to express our thanks to Dr. J. E. McCartney, director of the Southern Group Laboratory, for his unfailing coöperation and helpful advice, and to Dr. A. B. Rosher, director of the Mile End Group Laboratory in which the bacteriological examinations were carried out.

REFERENCES

Balachovski, S., and Guinsbourg, F. (1934) *Sang*, **8**, 622.
Goodall, J. R., Anderson, F. O., Altimas, G. T., and MacPhail, F. L. (1938) *Surg. Gynec. Obstet.* **66**, 176.
Grodberg, B. C., and Carey, E. L. (1938) *New Engl. J. Med.* **219**, 471.
McCartney, J. E. (1935) *Lancet*, **2**, 1476.

CLINICAL AND LABORATORY NOTES

CARDIAZOL CONVULSIONS

THE SUBJECTIVE ASPECT

BY J. E. O. N. GILLESPIE, M.B. Dubl., D.P.M.
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MANY writers on Cardiazol convulsion therapy have assumed that all or nearly all patients are terrified by the treatment, and some have suggested that its effect is due to the terror it produces and that it is thus the modern equivalent of the older methods of treatment such as whipping, rapid rotation and the like.

In the present investigation I tried to determine the subjective attitude to cardiazol therapy of forty-two patients, but only twenty-three were able to give reliable answers. Thirteen were women and ten men, three being doubtful manic-depressives and the rest belonging to the schizophrenic group. The amount of cardiazol given varied from 4 to 13 c.cm. of a ten per cent. solution and the number of injections from 1 to 30.

Each patient was asked to give an account of his or her experiences and then leading questions were asked. Three patients were indifferent to the effects of the cardiazol. The rest found it unpleasant, nine using mild expressions such as "I don't like them," "I am rather afraid" or "Could I have it by mouth instead?" The other eleven were stronger in their dislike, saying "They are terribly unpleasant," "The very thought of it makes me shrink with horror," or "I am terrified, nothing could frighten me more." While several patients asked that the injections should be stopped or some other treatment substituted, only three were actively resistant and required more than the usual steadying of the arm. Two of these cases did not think that the injections were particularly unpleasant, but objected to them for delusional reasons, fearing that they were going to be killed. The third patient dreaded the injections because of the sensations they produced. Four other patients were resistant at times.

The majority disliked the sensation of losing consciousness and described it as being similar to having an anæsthetic or to fainting. Their descriptions were mostly short and indefinite, such as "I just went under," or "Faces grew dim," but in other cases there were sensations which were remembered clearly and which were very constant in their occurrence. Feelings of dizziness, distancing of sound, and palpitation were common. Some thought that they could hinder or hasten the loss of consciousness. One patient saw flashes of blue and gold light and could feel her eyelids flickering; another had pleasant thoughts of a sexual nature; another always saw a photograph of her mother and heard her voice. One man heard a noise of wind and saw everything "with a rainbow edge," another described going off as being like drowning with a bubbling in his ears and nose. Ten patients noticed a pungent smell which they described variously as being sickly, like acid, chloroform, ether, iodoform or lavender. A trace of the smell often remained when the patient regained consciousness, and after one injection a patient complained of the smell for two days. Two patients did not know that they had become unconscious at all; two remembered dreaming; six complained of feeling sick for an hour or so after the injection and two actually vomited. Patients were mostly slow to attribute any improvement in their condition to the treatment and some thought that it was a form of punishment.

The patients' accounts tended to be clouded by their mental condition, and for this reason I decided to experience a cardiazol fit myself. After the injection of 10 c.cm. of a ten per cent. solution I felt my body and limbs coming to lie straight in the bed and my head turning to a central position. Then very rapidly something seemed to move in my arms and thorax and to pass up to the base of my neck, where it stopped and increased in intensity. This sensation was not painful, but felt very clear and circumscribed, half-way between thought and sensation like the ideas in delirium. Unconsciousness developed quickly but otherwise its onset felt like the coming of normal sleep and was not resisted. On awakening I had a mild occipital headache, some aching of the mandibular joints and was conscious of a pungent smell at the back of my nose. At first I could remember almost nothing of the morning's events including the injection, and even the day before seemed indistinct, but otherwise feeling and comprehension seemed normal. Remembrance of the injection returned within a few minutes and of the other happenings of the morning more gradually, but even ten hours afterwards there was some retrograde amnesia. For the remainder of the day the feeling was distinctly unpleasant, with headache, anorexia and malaise.

SUMMARY

Inquiry was made into the subjective sensations of twenty-three mental patients who received cardiazol injections. No specific sensation was noted except that ten patients noticed a pungent smell when losing consciousness. Less than half of the patients found the injections terrifying and only one of these was actively resistant. Two other patients were resistant for delusional reasons.

A personal experience of a cardiazol fit is described.

The sensations were mildly unpleasant but not alarming.

I wish to thank Dr. Porter Phillips, physician-superintendent of Bethlem Royal Hospital, and Dr. T. E. Harper, superintendent of Holloway Sanatorium for permission to publish this paper.

ADDISON'S DISEASE

IN A BOY OF 12

BY ARNOLD RENSHAW, M.D. Lond., D.P.H.
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ASSISTANT PATHOLOGIST TO THE HOSPITAL

ADDISON'S disease in children is extremely rare. The present case is interesting in that advanced tuberculosis of both adrenals was present at such an early age (12 years) and the symptoms strongly resembled those of appendicitis.

The boy was admitted to the surgical side of Ancoats Hospital under the care of Mr. P. G. McEvedy, on Dec. 10, 1938. There was a history of vague abdominal pain for two years, which was situated in the middle line and then radiated to the right iliac fossa for a week. He collapsed on Dec. 5 with abdominal pain and vomited two or three times during the week before admission. Bowels were constipated.

On clinical examination by the resident surgical officer (Mr. J. P. Philp) there was no pyrexia. The general condition appeared good. The tongue was clean and moist. Examination of the abdomen showed tenderness with some muscular guarding in the right iliac fossa. There appeared to be a fairly mobile and somewhat tender mass palpable in the right iliac fossa. The colon was loaded. Per rectum there was tenderness on the right side. Fæces were present.

Appendicitis was considered a possibility, but doubt was felt regarding a definite diagnosis in this case. The possibility of pyelitis was considered.

On Dec. 11 the patient complained again of a severe pain in the right iliac fossa. On examination there was some guarding in the right iliac fossa. There was no pyrexia. Microscopical examination of the urine showed pus cells and a few epithelial cells; culture was sterile. A 24-hour specimen of urine was requested for examination for tubercle bacilli, but the patient died before this could be obtained.

On Dec. 12 his temperature rose to 99·2° F. and on the 13th at 2 P.M. was 100° F., the child dying on the 14th with a temperature of 97·8° F. The pulse-rate varied between 100 and 120, being usually between 110 and 120.

NECROPSY

External examination.—The child appeared to be normally developed, with a generalised brownish pigmentation of the skin, of a type such as to attract the comment of one of the house-surgeons that his skin did not appear to have been washed, the colour being a dark brown and resembling the browning of exposed parts of the skin in the summer. There were no special pigmented areas apart from the orbit. The eyes appeared somewhat sunken, with a slightly deeper pigmentation in the skin over the orbits. There were two or three small round dark-brown spots on the forearms.

Cardiovascular system.—The heart and vessels appeared normal, except that the heart was possibly slightly small and the muscle somewhat brownish.

Respiratory system.—The pleura was totally adherent to the chest wall. The lungs showed some congestion but otherwise appeared normal. The upper respiratory passages, larynx, trachea, and bronchi were normal.

Gastro-intestinal system.—The pharynx and œsophagus appeared normal, although the tonsils showed some crypts. The stomach was very much dilated and contained about 200 c.cm. of bile-stained fluid. Small and large intestines appeared to be normal and showed no evidence of tuberculosis, but the large intestine contained scybalous masses. The appendix was long and twisted back on itself. The peritoneum and pancreas appeared normal. The liver showed a small amount of perihepatitis.

Genito-urinary system.—The right kidney contained a small tuberculous abscess in and near the cortex, about halfway down the kidney. The bladder walls appeared slightly thickened. The generative organs appeared normal.

Ductless glands.—The thyroid appeared normal. The thymus was persistent and weighed 7·5 grammes. Both adrenals showed caseation and a little calcification. The spleen appeared small and friable.

Nervous system.—The dura mater was slightly adherent round the longitudinal sinus, and there were several small white spots in this area on the surface of the brain; otherwise the brain, pituitary, and pineal body appeared normal.

The cause of death was syncope due to the lack of adrenal secretion associated with Addison's disease.

HISTOLOGICAL EXAMINATION

Section of one of the mesenteric glands showed no evidence of tuberculosis. Section of the right tonsil showed some hyperplasia, increased vascularity, and some fibrosis, but no evidence of tuberculosis. Section of the left tonsil showed the presence of very large crypts, with hyperplasia of lymphoid tissue, but no evidence of tuberculosis. The brain on section appeared normal.

Both adrenals showed an extreme degree of caseation, with the typical giant-cells of a tuberculous inflammation of these glands. The sections showed practically no normal adrenal tissue left. Section of the pituitary showed no disease, but the capillaries appeared to be unusually distended.

Section of the right kidney showed a caseous mass in the cortex just within the capsule, with lymphocytic exudate around, and some polymorphonuclear leucocytes and a few typical giant-cells. The renal tissue in and round this area was completely disorganised.

Section of the lung showed a little œdema but no evidence of tuberculosis. Section of the thymus showed atrophy of some of the glandular structure, but the larger proportion appeared to be functioning. Section of the liver showed some fatty change, chiefly an infiltration rather than a degeneration, with some dilatation of the bile-capillaries and cloudy swelling.

We acknowledge with thanks the assistance given us by Mr. P. G. McEvedy and the clinical staff in publishing this case.

". . . Mirijevo, a village near Belgrade, where there are some twenty gypsy families whose material condition is comparatively good, is renowned for the fact that its gypsies eat carrion. When a peasant has a sow or hog or an ox that has died of some disease, he buries it in a piece of ground near the road. Someone will then inform the gypsies of the fact, and they will pay a small sum for the information. . . . Some of the poorer gypsies eat carrion meat without special preparation; but others prepare it by washing, soaking with nettles or garlic, and boiling until the smell has gone. Sedentary gypsies eat carrion meat only when with gypsies who prepare it in this way. It is then said, however, to be tasteless; while those who express preference for the flesh of animals that have died, say that it is on account of its flavour, which is superior to that of slain meat. Whether the sense of smell among gypsies is deficient is neither clear nor easy to ascertain. Their vocabulary, though not decisive one way or the other, suggests that they do not discriminate very decidedly between smells, good or bad."—Abstract in *Nature, Lond.* Feb. 1939, p. 248, of paper by A. Petrović in *J. Gypsy Lore Soc.* 1939, **18**, 1.

MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE

SECTION OF ORTHOPÆDICS

AT a meeting of this section held on Feb. 7 the chair was taken by Mr. A. ROCYN JONES, and a discussion on

Congenital Dislocation of the Hip

was opened by Mr. H. A. T. FAIRBANK. The first essential, he said, was early diagnosis. The younger the patient the simpler the treatment, the better the chance of permanent cure and the more perfect the hip when growth was completed. A congenital deformity might be suspected before the child began to walk, and a greater effort should be made to get the cases earlier. Any suspicious case should be sent to a radiologist. By "pre-dislocation" was meant the condition in which the acetabular roof sloped and the centre for the femoral head was smaller than on the other side, but displacement was absent or only very slight. These cases should be treated as potential dislocations.

The routine treatment should be bloodless reduction, and fixation for long enough to make the reduction permanent. The one exception was subluxated hip in a child of four or five, which should be treated by manipulative reduction and—after an interval—open operation to improve the shape of the upper acetabular margin. In other cases open reduction was quite unnecessary. Bloodless reduction might be effected by Putti's method of simple abduction or by manipulation under anæsthesia followed by fixation in plaster. The first procedure became insufficient at about the age of twelve months. The objects of manipulation were to reduce the dislocation and to force the limb into the position required for stability and fixation. Reduction by lifting should always be tried before resorting to leverage, as it caused less stretching and trauma. Leverage by forcible abduction was always necessary later to get the head well home in the socket. The muscles should be stretched as much as possible before tearing the longus, and should be kept as taut as possible while sudden pressure was applied to the tendon. A very important stage, after apparent reduction (and one sometimes omitted), was to make sure the head was well home by—in A. Lorenz's words—"lifting the lid off the acetabulum." The idea was to put different portions of the capsule on the stretch and make sure that none of it was caught between the bones. If the stretching of the hamstrings were stopped when the gracilis was felt to give way there was no danger to the external popliteal nerve.

In difficult cases it should be remembered that reduction resulted always from the head slipping over the posterior margin of the socket, with the thigh in abduction. Denucé's method and traction on the extended leg with hyperextension (to stretch the psoas) were useful techniques at times. Before putting on plaster the stability of reduction should be tested by noting the angles of flexion and adduction at which redislocation took place. The smaller the child the smaller the range of stability compatible with a good prognosis. The knee should not normally be included in the plaster, as functional activity and weight-bearing were important adjuncts to reduction. The opposite leg should be included only in the younger fat babies and when there was doubt about the stability of the undislocated hip. Adduction was a dangerous strain on a hip that was not absolutely normal.

Afterwards the child was nursed on a flat bed with a small square sandbag beneath the buttocks where the plaster did not cover. In a week active and passive extension of the knee, and after a month walking, were started. Abduction was not reduced until X-rays showed some improvement in the acetabular margin, about 12 or 14 months after operation. Anterior subluxation was looked for at each monthly visit. On removal of the plaster, a month or two later, abduction was quickly overcome by the child's own activity, but external rotation might take a little longer. The position of the femoral head with regard to the centre of the acetabulum was of greater prognostic value than the shape of the upper margin of the socket.

The greater the surgeon's experience the more inclined he was to lower the age-limit for attempting reduction and to find reasons for not tackling obviously unfavourable cases. Mr. Fairbank said he had not had much trouble from antetorsion.

The indications for open reduction were two: when the hip was very unstable and not easily controlled by the axillary position, or the post-reduction radiogram showed the head displaced outwards or upwards from the central position; and when manipulative reduction failed, the child was the right age and there was no contra-indication to severe operation. The "right" age was four at most for a bilateral case and rarely above six for unilateral dislocation. Something should be done to improve the upper acetabular margin; if possible, the full "shelf operation" should be included. This manœuvre was indicated in untreated unilateral subluxation in a child of four or five; and when a hip treated by a bloodless method threatened to relapse. It was imperative in the untreated subluxated hip of four or five. It was not difficult to make an upper lip, but it was difficult to make it in the right place.

Mr. HARRY PLATT reported on 280 cases in his experience; 80 cases had been bilateral and 42 of the children had been male. He had had, in addition, 24 cases of subluxation, which he regarded as generically different. Of these, 2 had been bilateral and 4 had been males. Only 17 cases of congenital dislocation and 4 of subluxation had been treated after the age of fifteen and only 8 cases of congenital dislocation had been less than a year old. He had performed 31 open reductions and 29 shelf operations for congenital dislocation and 2 open reductions and 4 shelf operations for congenital subluxation. The gradual abduction treatment for babies under twelve months had succeeded in 3 cases and failed in 3 cases. Early diagnosis was very important. Accidents and disasters had included 3 deaths, 9 fractures and 1 case of infection. The stigmata were asymmetry of the limb, asymmetry of skin creases, shortening, and limitation of abduction. They might exist without dislocation, however, and the diagnosis must rest on radiography. When they were so well marked at an early age that the mother noticed them, the dislocation very often proved to be of Putti's "primitive" type with real malformation of the femur, and reduction proved very difficult. One of the cases successfully treated by abduction had been diagnosed at five months and cured after nine months on a divaricator. He had only had one case that at all suggested spontaneous reduction.

When he used manipulation Mr. Platt preferred Denucé's method and believed in stretching the capsule. He included the knee and the opposite hip in the plaster, as this made for greater security and added comfort in nursing. He used plaster for 9–12 months and in the second stage brought the hip into as much internal rotation as it would allow without forcing. He used weight-bearing only after removal of plaster, when satisfied that the head was central and there was no muscle spasm. A check postoperative radiogram should be taken before the plaster was applied to show a concentric femoral head. Of 31 cases treated by manipulation more than ten years ago, representing 40 hip-joints, 8 had been over five when treated: there had been 15 perfect results, 13 with good function but some blemish, 10 with fair function and anatomical incongruity, and 2 really poor results. Unsatisfactory results were seen, even in children treated at the favourable age. It was no longer justifiable for the orthopædic surgeon to learn from his own mistakes. No-one should treat these cases until he had served a long apprenticeship. Certain anatomical facts predisposed to failure; one was anomalous capsule attachment. If the capsule were attached to the middle of the head or adherent to the socket, apparent reduction was deceptive. Another intrinsic cause of failure was inadequate development of head or socket. A nimbus of cartilage might prevent reduction. Osteochondritis might be present in quite young children or might develop after reduction, even when there had been no violence.

Open reduction must be done early if at all. The capsular isthmus was common, and must be stretched or divided. A shelf was unnecessary if internal rotation could be secured and the head levered into the primitive socket. Repeated manipulations should be avoided if open operation were to be considered. There should be a period of mobilisation before any weight-bearing was attempted. A shelf which merely prolonged a sloping roof over an excentric reduction was useless, except to give a fine X-ray picture. There was always a risk that the growth of the socket would be interfered with. Sometimes a shelf was produced by nature.

Mr. D. N. ROCYN JONES recorded 95 cases examined by himself; about 40 had had open operation. There was a marked difference according to age; under four there had only been one failure to reduce. In 7 cases constriction of the capsule had been seen at operation; it did not seem a common cause of failure. In 2 cases the capsule had been adherent to the false socket above the acetabulum. In many radiograms the roof looked inadequate, and at operation very few looked hopeful. The bony upper rim did not become defined and bony until after four. At least as much attention, therefore, should be paid to clinical as to radiological results. If fixation was maintained for more than a year, the results seemed better than after shorter periods. The most successful type of operation seemed to be an attempt to turn the acetabulum over the femoral head with the insertion of a wedge. There did not seem to be any undue shock about the operation; the shock seemed to be greater when the wet cold plaster was applied. Full function sometimes did not return until about two years after operation. The method of choice up to four was manipulation followed by plaster; at four or five it was arguable whether it was better to manipulate or do an open operation at once. In older children, or if manipulation failed, operation was indicated and should take the form of augmenting the roof of the acetabulum.

Mr. G. F. BATCHELOR spoke in favour of putting up hips in internal rotation after the age of twelve months. Anteversion was present in many hips. It was best overcome by retention in internal rotation, and there was less likelihood of redislocation than in bringing it down from Lorenz's first position. Moreover, in internal rotation it was easier to combine retention with function. The hips need not be immobilised in a plaster spica. Moderate abduction could be maintained by a bar between the knees. The advantages were: absence of wasting contracture, comparative freedom of the child, and functional activity encouraging normal development of the joint.

Mr. WHITCHURCH HOWELL emphasised the importance of getting the patients up early; urine must not be allowed to stagnate in the kidney pelvis or renal calculus might result. He set the children up in an apparatus within 24–48 hours of operation; the patient could be tilted to various angles and could kick and stretch, and could be sent home early. In his experience, dislocation of the hip was not infrequently familial. Open reduction should be done on an orthopædic operation table, and skeletal traction was helpful. There was considerable shock, and transfusion should be given as routine. The easier the dislocation, the easier the redislocation. Difficult cases should not be given up now that powerful skeletal traction was available.

Mr. W. B. FOLEY spoke in favour of internal rotation, and thought that older cases might be reduced by a modification of the double abduction frame combined with traction, applied gradually. A side pull could also be put on. Operations were extra-articular, done on the frame, and were quite without shock.

Mr. J. C. SCOTT showed slides illustrating this apparatus. Abduction up to 90° could be obtained, and then weight and pulley abduction applied.

The CHAIRMAN commented on the great advances which had been made in the treatment of this condition. He was glad to learn that manipulation was still the treatment of choice.

MEDICAL SOCIETY OF LONDON

AT a meeting of this society on Feb. 13, with Dr. C. E. LAKIN, the president, in the chair, a discussion on the

Use and Abuse of Purgatives

was opened by Sir ARTHUR F. HURST. He described the physiology of the small and large intestine, explaining that food passed rapidly through the small intestine, where it was churned by a process of peristaltic and segmenting movements, and nearly all digestible constituents had been removed by the time it reached the cæcum. The semi-fluid material remained in the cæcum and ascending colon for some time, during which most of the water was absorbed. Waves of contraction took place at certain times of the day, which carried the chyme through by stages into the pelvic colon. Under normal conditions the transverse, descending and iliac colons were never filled but were merely passage-ways. Peristalsis was only seen in the colon under exceptional conditions. The mass movements usually took place soon after meals. There was a continual movement in the haustra of the colon, but one too slow to be perceived on the screen. Defæcation was the result of a conditioned reflex which was originally learned by the infant when

it was taught to empty its bowels in a clean way by being placed on a chamber. The reflex induced a mass movement from the pelvic colon into the rectum, and tension on the rectal walls brought about a conscious desire to defæcate. Evacuation was performed by voluntary and involuntary contraction of the abdominal and rectal muscles and relaxation of the anal sphincter. Defæcation concerned the whole of the colon, and in persons who had voluntarily abstained from defæcating for a day for experimental purposes the first motion was soon followed by a mass movement in which the whole colon was cleared, and then by a second motion.

Thirty years ago Sir Arthur had suggested that constipation should be divided into true colonic constipation, where passage through the colon was delayed, and dyschesia, in which there was a defect in the mechanism of defæcation. He was now inclined to think that even the former group of cases were really due to dyschesia. One of the commonest conditions for which patients came to a physician was a definite syndrome resulting from abuse of purgatives. Two-thirds of the patients were women, and they all complained of what they called constipation, but they all admitted that their stools were either liquid or semi-solid—i.e., that they were suffering not from constipation but from diarrhœa. The fæces contained mucus and occasionally a little blood, and in some cases colitis was diagnosed: all had abdominal discomfort, associated with much flatulence. Some had attacks of pain, and some had had their appendices removed for such attacks. Many had had adhesions divided, and an equal number had had adhesions made. More general symptoms were anorexia, with loss of weight, fatigability and anæmia. Some had become really constipated after stopping their aperients for a short time, but had been surprised at feeling better. Some had taken gigantic doses, such as sixty senna pods every night, or a handful of liver pills. Some thought they were constipated not through any irregularity of their bowels but because they had symptoms resembling those described in advertisements for liver pills. The popular idea of the symptoms of auto-intoxication led many patients to take aperients.

After two or three weeks in hospital the majority of the patients were definitely cured. All aperients were stopped, and they were given non-irritating vegetable mucilage or a little paraffin. The condition was explained to them and they were told that they would have to make an effort to empty their bowels. Most patients began at once to get their bowels open and at the end of a fortnight had regular motions every day and were amazed to find how comfortable they were without aperients. Mucilages and paraffin were not purgatives, but to a large extent replaced them. Paraffin was less satisfactory, because it tended to make defæcation fragmentary, so that the colon was not properly emptied. The basal mucilages left a clean colon and rectum and caused much less flatulence. The best preparations were agar, the French Coreine, and the English Isogel. Normacol contained an aperient, psyllium seeds. Petrolagar acted only by the paraffin which it contained; the agar was merely an emulsifier. A true purgative might be required for patients who must be spared effort in defæcation—e.g., those with high blood-pressure. Infusion of senna pods was the best drug, as it had no effect on the small intestine and therefore did not flood the colon with largely undigested chyme. The dose was easy to regulate. Briefly, Sir Arthur concluded, the abuses of purgatives were many but their uses were very few.

Dr. H. L. GLYN HUGHES, speaking from the angle of the general practitioner, said it was almost time purgatives were made dangerous drugs by statute. Their chief danger was that they disturbed the normal rhythm. Absolute regularity of the conditioned reflex was the principal aid to health. Only harm could come from irritating aperients and coarse food. The continual excessive use of alcohol, which excited catarrh, was in a way an abuse of a purgative. Four types of constipation could be recognised: atonic, spastic, dyschesic, and that resulting from abnormal conditions of other organs or from disease. The commonest form was the spastic, which was probably due to localised hypersensitive areas. In chronic lead poisoning purgatives and rough food were definitely harmful. Atonic constipation often dated from irregularity in childhood: aperients might have to be used to re-educate the bowels, but should be discontinued as soon as possible. He agreed that senna was the best drug for this purpose. The commonest diseases which produced constipation were the febrile disturbances, diabetes, diseases of the heart, lungs, liver and kidneys, and disorders of the central nervous system which lowered the sensitiveness of the bowels. Aperients were harmful where there had been dehydration, or in polyuria. In patients with a urinary disorder, such as infection by *Bacillus coli*, they might cause an exacerbation. Physostigmine and pituitary extract were often wrongly given for postoperative distension. Purgatives were entirely valueless for dyschesia, and re-education was the only remedy. Small enemata were invaluable, with lavage of the large intestine. Salines were useful for portal congestion and produced many cures of so-called rheumatism by scouring the liver and gall-bladder. They should never be given to weakly persons or patients suffering from hæmorrhoids or other painful conditions of the rectum. Castor oil had the advantage of producing a single evacuation with complete emptying, and might be useful in spastic conditions. Mercury was better given in divided doses and should always be followed by a saline. To empty the bowels had little value in acute diseases and might do harm by exhausting the patient. Normal persons varied greatly in their rhythm of evacuation. A bed patient should be allowed to get up to go to the water-closet as soon as possible.

Dr. F. PARKES WEBER declared that the most rational treatment of habitual constipation in adults was properly prepared bran in suitable quantities with meals. Its use could be discontinued suddenly without harm. Constipation was not now so prevalent, but its former frequency must have indicated very wrong habits of diet or of education in infancy.

Dr. J. B. WRATHALL ROWE suggested that vitamin B_1 rather than roughage was the beneficial factor in bran and wholemeal bread. Many Americans habitually took tablets of brewers' yeast and praised it as a remedy for atonic constipation and dyschesia. He asked whether in medieval times the Englishman had eaten five hundred times as much vitamin B_1 as he did today.

Mr. V. ZACHARY COPE said that one of the movements of the proximal colon was antiperistalsis. A lady of seventy had gangrene of the cæcum, for which he had performed a short-circuiting operation. Until the colostomy had been closed, formed and regular motions had passed out through it although there had been a clear passage through to the distal colon. This had been due to antiperistalsis, which had been observed by Canonsworth as one of the common movements of the colon. He pleaded against

the wanton use of purgatives to which surgeons were persuaded. The average layman and even the trained nurse believed that a purgative was necessary before and after operation. Surgeons ought to fight that enormous body of opinion. There was no need for a purgative after an ordinary abdominal operation—certainly not for several days. A gentle enema would often relieve the large bowel. In peritonitis purgatives might cause disaster by spreading the infection.

Mr. C. W. GORDON BRYAN confessed that surgeons found it very difficult in practice to ensure that their orders against purgatives were carried out by the nursing staff, who were convinced that it was right to give them. Continuous paraffin drinking might be responsible for chronic disorder of the colon. He had seen that afternoon a baby of seven months who had been admitted for intussusception. On the advice of a children's clinic it had been given paraffin twice a day from birth, a practice which might have had something to do with its symptoms. During the last few weeks it had also been fed on carrots and cabbage.

Mr. E. L. PEARCE GOULD remarked that some people would go to great lengths to train their conditioned reflex. He described the complicated and invariable ritual performed after breakfast by an aged relative of his, who would never sleep a night out of his own house for fear it would be disturbed. The ordinary person who for some reason did not move his bowels after breakfast could often take advantage of the mass movement which usually occurred after lunch or dinner. The great difficulty in treating persons who had the purgative habit was to interest them in the training of the reflex without letting them replace one obsession by another.

The PRESIDENT asked for justice for the pill and mentioned a doctor who had practised in his 87th year and had taken a rhubarb pill every night. He thought it curious that the pill could be taken on retiring, when peristalsis was most quiet, and not earlier in the evening.

Dr. L. CARLYLE LYON spoke of the danger of taking purgatives during abdominal pains and converting a subacute appendix into an acute one. The public should, he thought, be warned of the risk.

Mr. J. E. H. ROBERTS said that the poor public had been abused by several speakers, but they were only following what they had been taught by the profession. He believed that Sir Arthur Hurst had been responsible for the sale of paraffin in half-gallon bottles, and many other drugs had been recommended. Until the doctors agreed the public should not be blamed. It was difficult for a surgeon to find out what went on in his own wards. Hospital medical officers should see that their house-officers did not write on case-sheets, as a routine, a list of six or eight purgatives to be administered by the sister at her discretion.

Prof. J. PLESCH asked for an explanation of the function of Bauhin's valve. It closed by imposition of the under lip on the upper to prevent reflux into the ileum from the cæcum. Its incompetence was associated with many disease conditions in which constipation was prominent. In animals the under lip appeared to be larger than in man, and in hardly any animal was it possible to force fluid past the valve in the wrong direction. Its incompetence could only be explained in man by assuming that it had an orbicular action. Its failure might be a cause of constipation through depriving the mass movement of a fulcrum. Flatulence as a complaint was less prevalent on the Continent than in England, perhaps because it was less socially obnoxious; constipation really seemed a far greater problem in England than abroad. An explanation might be an unreasonable insistence upon a motion every day. The use of agar had been based on a fallacy that it was a cellulose and so produced a natural loading of the bowel. The vegetable mucilages were really hexoses. Pure agar had a constipating effect, and Adolf Schmidt had therefore added cascara to it. He could not understand why laminaria, with its very high coefficient of swelling, was not used. The swelling power of a colloid was proportionate to its adsorptive power, and it was almost certain that all the swelling bodies worked also as adsorbents. If, however, an adsorbent was to be used, it would surely be better to choose one with a reversible action.

Sir ARTHUR HURST, in reply, doubted whether atonic constipation existed; for the tone of the colon, like that of the stomach, was hardly ever abnormal. Taxol was a great favourite with the public and also, he was sorry to say, with the medical profession. The intestinal extract and bile it was said to contain could have no action, nor could its lactic acid ferment by the time the patient needed it, and the agar it contained was practically negligible. Experiments had shown that some part of a dose of agar could be absorbed. Bauhin's valve had no importance, for the work was all done by the ileocæcal sphincter, the absence of which after certain operations might explain an apparent retroperistalsis. The fluid contents of a tube would, in the absence of propulsion and resistance, move in either direction.

THE ALL TOO COMMON COLD

WRITING in the clinical supplement of the *King's College Hospital Gazette* for January Mr. Terence Cawthorne reviews and evaluates existing methods of treating the common cold, which he defines as an acute infection of the upper respiratory tract caused by an unknown virus and spread by overcrowding, under-ventilation or sudden variations in climate. In an interesting review of the current remedies he dismisses all drugs with the exception of the alkalis, the sulphanilamide group (which may turn out to be useful against secondary infection), and certain of the coal-tar preparations. As local treatment he favours heat (inhalation of steam with friar's balsam), and tolerates mild astringents such as 0·5 per cent. ephedrine in normal saline. Nasal antiseptics are best avoided in the acutest stages, "and it is probable that the numerous preparations that are in general use do more harm by irritation than good by disinfection," while "it is doubtful whether oily preparations do any good at all." Secretion should be removed by gentle blowing of the *open* nose into a *paper* handkerchief; douches are mentioned only to be condemned. Turning to prevention, the most important measure, he thinks, is to avoid contact with those already infected, who should go to bed in a warm room for two or three days. Though such counsel is ideal rather than practicable in the modern world, it would nevertheless be practised far more often if there were more sense and less false heroism. He urges every doctor to impress upon his patients the need for taking colds seriously—advice which may appear redundant to many an overworked practitioner at the present time who finds no stint of patients ready and anxious to discuss their colds with him at any hour of the day or night. But if Mr. Cawthorne fails to get to the root of this complex matter he is not to be blamed. Avoidance of contact with infected persons is, after all, of only secondary importance. The primary problem is how to increase what, for want of a better term, must still be called resistance to infection.

REVIEWS AND NOTICES OF BOOKS

The Pituitary Gland

An investigation of the most recent advances. Edited by WALTER TIMME, ANGUS M. FRANTZ, and CLARENCE C. HARE. Baltimore: Williams and Wilkins Co.; London: Baillière, Tindall and Cox. 1938. Pp. 764. 45*s*.

THIS is the seventeenth volume of the series of publications of the Association for Research in Nervous and Mental Disease, and contains the papers read before the association in December, 1936. The papers fall into three main sections: anatomical, physiological, and clinical. F. Tilney discusses the phylogenetic features of the pituitary and demonstrates the constancy of its fundamental constituents and mode of development throughout the vertebrates. G. B. Wislocki summarises his recent work on the vascular supply of the gland and reiterates the points upon which he and his co-workers have differed from Popa and Fielding concerning the function of the hypophyseal-portal system. A useful summary of the available statistical data is provided by A. Rasmussen, from which it appears that hardly anything is yet known of the weight-curve of this gland during childhood and adolescence.

While little advance has been made lately in our knowledge of the histology of the pars nervosa, much work has been devoted to its hormones, particularly the antidiuretic secretion. Of special note is the experimental work on diabetes insipidus by S. W. Ranson, C. Fisher, and W. R. Ingram, the protagonists of the theory that the hypothalamus governs the secretion of the pars nervosa, and that mechanical interruption of the supraoptico-hypophyseal tract will cause diminished secretion of the antidiuretic hormone and hence polyuria. It appears that polyuria always precedes polydipsia, and diabetes insipidus does not become established in the absence of anterior lobe tissue. This raises the vexed question as to the site of formation of the antidiuretic hormone. Recent work gravitates again towards the view that it is elaborated in the pars nervosa and not in the pars intermedia, largely because the latter is absent in certain animals such as the whales. These animals have been studied by E. M. K. Geiling and L. L. Robbins, who find that the potency of the pars nervosa in the whale in respect of pressor, antidiuretic, and oxytocic substances is as great as that of bovine extracts. The latest work offers no support to the theory, once widely held, that these posterior lobe hormones are secreted into the cerebrospinal fluid. If Wislocki's conception of the vascular supply of the pituitary is correct, there is no circulatory connexion between the pars nervosa and the hypothalamus. Thus the Herring bodies, which until recently were regarded by many—possessed of more imagination than histological insight—as an outward and visible sign of the transport of posterior lobe secretions to the floor of the third ventricle, are now dismissed as artefacts.

Much interest attaches to the controversy between H. M. Evans and O. Riddle as to the existence of a specific growth hormone, the effects attributed to such a hormone being produced experimentally, according to Riddle, by prolactin. Conflicting observations are perhaps in part due to the great difficulty in obtaining pure extracts from the anterior lobe for these experiments. Collip, in the course of the discussion, expressed the opinion that the normal living gland probably produces only three hormones. Thus, in his words, one prosthetic group of a single protein molecule may represent the growth hormone activity, another prosthetic group the adrenotropic effect, and still another prolactin. The term growth has undoubtedly been used far too loosely in this kind of work to denote increase of weight, whether due to obesity, retention of water, or to true growth. An analysis of such changes is described in a useful article by M. O. Lee.

In the clinical section informative articles will be found on röntgen therapy of pituitary tumours by C. G. Dyke and C. C. Hare, and on the surgical treatment of these tumours by G. Horrax. The general level of production of the volume is fully up to the standard of its predecessors.

Clinical Studies in Lactation

By HAROLD WALLER, M.B. Camb., superintendent medical officer to the Royal College of St. Katharine, Poplar; consulting physician to the British Hospital for Mothers and Babies, Woolwich. London: William Heinemann. 1938. Pp. 173. 7*s*. 6*d*.

THOUGH in the recent controversy in the medical journals many different explanations were put forward to account for the decline in breast-feeding, Dr. Waller here seeks to explain the decline on what seem novel grounds. The novelty of his views is perhaps due to the fact that they are based on what he has seen himself rather than on the usual text-book descriptions of the phenomena of lactation. He has come to three main conclusions. First, that lactation is largely a conditioned reflex, and that the ease with which the baby obtains the milk depends to some extent on its being actually expressed by the breast into the baby's mouth. Secondly, that the engorgement of the breasts which is so often seen between the third and sixth days of the puerperium is abnormal and due to some obstruction in the outflow of the milk. Finally, that while this obstruction is sometimes due to malformation of the ducts, it is more often caused by inspissated secretion. Dr. Waller looks upon engorgement as one of the chief reasons for the failure of lactation, and he lays down an antenatal and postnatal regime for its prevention. His arguments and the cases illustrating them are impressive.

The book deserves to be widely read, and should stimulate those in charge of maternity hospitals to inquire further into the new ideas it presents.

Tuberculosis Among Children and Young Adults

(2nd ed.) By J. ARTHUR MYERS, Ph.D., M.D., F.A.C.P., chief of medical staff and director of tuberculosis activities, Lymanhurst Health Center; professor of preventive medicine, University of Minnesota. Springfield, Illinois: Charles C. Thomas. 1938. Pp. 401. $4.50.

IN the eight years that have elapsed since the first appearance of this book many fresh facts have come to light about the baffling subject of tuberculosis in young people. This has necessitated many alterations in the text and the addition of new sections, principally those dealing with the reinfection type of pulmonary tuberculosis of young adults, which bears an even closer relationship to the primary infections of childhood than was formerly believed. Particularly valuable is the chapter discussing sensitisation and immunity and the clear distinction between them. Dr. Myers points out that sensitivity can be measured whereas we have no means of measuring immunity,

and the acquisition of the one does not necessarily imply the acquisition of the other. This is often overlooked and was not even realised when Calmette began to use his B.C.G. vaccine. Indeed, Dr. Myers still regards B.C.G. vaccination as a huge experiment from which no final conclusions can be drawn for at least another decade.

The book is divided into three parts dealing with the infant, the child and the young adult, and separate consideration is given to tuberculosis as a family disease and the danger of elderly people infecting the young. Dr. C. A. Stewart writes on tuberculous pulmonary disease in childhood, while Dr. P. W. Giessler contributes an article on tuberculous disease of bones and joints. Each chapter ends with a summary and bibliography, and the book as a whole is an excellent short account of a most difficult subject.

Pye's Surgical Handicraft

(11th ed.) Edited by HAMILTON BAILEY, F.R.C.S., surgeon to the Royal Northern Hospital, London. Bristol: John Wright and Sons; London: Simpkin Marshall. 1939. Pp. 512. 21*s*.

THIS old-established guide for house-surgeons has been entirely recast by the author, who has called to his aid twenty-eight experts in the subjects on which they write. In a general textbook for undergraduates multiple authorship has many drawbacks but it has none in a book of this kind. It would be difficult to find a subject about which a house-surgeon might need information which is not included in this excellent compilation, and there is no padding and no redundancy. Pye's original work first appeared 54 years ago, since when it has been repeatedly revised and brought up to date, so that it has never been displaced in the affections of students and surgeons of all degrees of experience; in its new form it is likely to become the cherished possession of a new generation of active surgical practitioners.

Bacteriology

For medical students and practitioners. (2nd ed.) By A. D. GARDNER, D.M., F.R.C.S., professor of bacteriology, University of Oxford. London: Humphrey Milford, Oxford University Press. 1938. Pp. 274. 6*s*.

THIS little book sets out the elements of bacteriology in a handy and readable manner and at a reasonable price. The information given is reliable but the compression has perhaps been too great to develop the fundamentals of the subject adequately, and the author rightly recommends that it should be supplemented by reading from a larger textbook. It will prove particularly useful for students revising their bacteriology for their final and other examinations.

A Concise Pharmacology

By F. G. HOBART, Ph.C., M.P.S., head of the pharmaceutical department and lecturer in pharmaceutics at Westminster Hospital; and G. MELTON, M.D., M.R.C.P., sometime medical registrar at the hospital. London: Leonard Hill. 1938. Pp. 171. 7*s*. 6*d*.

THIS book sets out to present concisely but in sufficient detail the pharmacology of the more important drugs. The subject is considered under broad headings such as anæsthetics and antiseptics, and the drugs coming into each section are arranged alphabetically. The sections are not all wisely chosen: for example, one is devoted to the aphrodisiacs, and contains a description of œstrin among a number of drugs of dubious efficacy. In this section, too, it is surprising to see prostate substance advised for enlarged prostate. Most of the book is of a higher standard than these examples indicate and quite adequate for revision purposes. It contains, however, references to far too many unimportant drugs such as holarrhena, amni visnaga, and adhota, and the space they occupy would have been better allotted to more detailed descriptions of the essentials, for ether occupies only fifteen lines. A large number of proprietary remedies are listed and starred to distinguish them from official preparations, and the book is interleaved throughout with plain pages so that the student may add his own notes.

Practical Microbiology and Public Health

For students of medicine, public health and general bacteriology. By WILLIAM BARNARD SHARP, S.M., M.D., Ph.D., professor of bacteriology and preventive medicine in the University of Texas. London: Henry Kimpton. 1938. Pp. 492. 18*s*.

THIS book represents a full and leisurely course of practical work in elementary bacteriology and parasitology which would provide the student with a sound knowledge of the subject. Its later sections deal with the wider applications to administrative hygiene and include material not usually found in textbooks of bacteriology. The greater part of the book consists of working instructions but there is enough connecting material to give it cohesion. A course such as is here set out would be too cut-and-dried to be easily adapted to medical schools in general—the average teacher would want more scope for individual methods—but as a description of the practice of a specified medical school this book is admirable. Teachers will find in it many useful suggestions for the planning of their own practical courses.

Clinical Obstetrics

By A. LAKSHMANASWAMI MUDALIAR, B.A., M.D., F.C.O.G., professor of obstetrics, Madras Medical College, University of Madras. Edinburgh: Oliver and Boyd. 1938. Pp. 819. 27*s*.

Prof. Mudaliar has added another to the growing number of good manuals waiting to guide the student in obstetrics. His book is written primarily for Indian students or those elsewhere in the tropics and gives special mention to the adverse effects of devitalising diseases and the late calls for medical aid. The style is rather telegraphic, the points of each heading being listed and numbered, but this will appeal to the student who depends on an excellent memory and therefore wants his facts tabulated. The directions for artificial feeding given seem to err towards undernourishment, for the baby does not have even equal parts of milk and water until three months and only a 2½ oz. feed at four weeks. The incidence of eclampsia is said to be the same in the tropics as elsewhere, and Prof. Mudaliar deals with the subject thoroughly and on orthodox lines, except that he considers the possibility of discharging a recovered eclamptic home to await labour. He wisely warns junior practitioners not to attempt manipulations such as internal version when labour is advanced, although these can safely be carried out by the more experienced. It seems unfortunate that three important subjects—blood-transfusion, analgesia in labour and postnatal care—are relegated to appendices where not every reader will study them. Their content certainly warrants their inclusion in the book itself. This volume will, however, admirably fulfil its purpose of providing a sound introduction for students.

THE LANCET.

LONDON: SATURDAY, FEBRUARY 18, 1939

IMMUNISATION WITH ARTIFICIAL ANTIGENS

A BRIEF letter to *Nature* from W. F. GOEBEL[1] of the Rockefeller Institute opens a new chapter in the advance of the organic chemist in immunology. This movement, in which workers at the institute have played a major part, started along two lines that have since converged. KARL LANDSTEINER and his colleagues, by linking simple chemical compounds to proteins, and injecting these synthetic antigens into rabbits, succeeded in producing antisera that showed a specificity dependent on the simple chemical compound that had been introduced into the antigen. Thus they produced antigens and antibodies whose specificity depended on atoxyl, tartrates, benzoic acid, and other compounds of known constitution. This enabled them to study the effect on immunological specificity of various changes in the structure of the chemical compounds concerned, of shifting a particular grouping from the ortho to the meta position in the benzene ring, of substituting a carboxyl by a sulphonic group, of inserting a methyl group, and so on. As one result of these studies LANDSTEINER demonstrated that compounds which contained the specific determinant grouping, but which were not linked to proteins, might react specifically in the test-tube with the homologous antisera, though they failed to stimulate antibody production when injected into rabbits. To these partial antigens he gave the name of haptens.

AVERY and HEIDELBERGER, starting from another angle, investigated the chemical nature of the capsular material that confers immunological specificity on the different types of pneumococci. They found that the type-specific substance consisted of a complex polysaccharide, different for each of the serological types. From several of these types they succeeded in isolating the specific polysaccharides in a highly purified form; and they determined the products of hydrolysis, thus identifying the simpler constituents of which the complex polysaccharides were composed. The complex polysaccharides were found to have the properties of LANDSTEINER'S haptens. They gave specific precipitation in the test-tube with the corresponding antisera produced in response to the injection of intact pneumococci, but they had lost the power of stimulating antibody production themselves.

These two lines of work converged when it was shown that, by linking these purified polysaccharides to proteins by the method devised by LANDSTEINER, it was possible to restore their full antigenicity, so that, by injecting the protein-polysaccharide compounds into rabbits, specific antisera would be produced which would react either with the purified capsular polysaccharide or with intact pneumococci of the corresponding type. The advance now recorded by GOEBEL is the demonstration that, in order to obtain an effective antigen, it is not necessary to include the whole complex polysaccharide in its unaltered form; for a simpler constituent containing the essential chemical groups in their specific pattern will suffice. Thus in the particular case of the type III pneumococcus an antigen was prepared by linking to horse globulin the glucoside of cellobiuronic acid, the acid that forms the unit out of which the complex type III polysaccharide is constituted. The serum obtained by the injection of this synthetic antigen into rabbits precipitates the complex type III polysaccharide, agglutinates type III pneumococci, induces the characteristic capsular swelling, and confers passive protection on mice. Animals injected with this artificial cellobiuronic-acid antigen themselves acquire an active immunity against type III pneumococci. A point of additional importance is that antisera prepared against this artificial antigen protect mice against type II and type VIII pneumococci, as well as against type III. It is known that there is an antigenic relationship between types III and VIII, so that this cross-protection should not, perhaps, be credited with too much significance; but there is clearly a suggestion that antigens prepared with the unit constituents of complex polysaccharides may have a wider range of reactivity than those containing the complex polysaccharides in their unaltered form. If this is so, the induction of an effective immunity against a bacterial species containing a large number of different serological types may have been brought a little nearer achievement.

1. Goebel, W. F., *Nature, Lond.* Jan. 14, 1939, p. 77.

THE LOST SWAB

THE Court of Appeal delivered an important judgment last Friday when directing that there should be a new trial of the action in which Mrs. Mahon had been awarded damages at Manchester assizes against Mr. R. P. Osborne, F.R.C.S., of Drinkwater Park Hospital, Prestwich. It will be recalled that this was a claim alleging negligence against a surgeon in that a swab had been left in a patient's body. The arguments in the Court of Appeal were summarised in this column recently (*Lancet*, Jan. 28, p. 242). The decision of the Court of Appeal is a majority decision of two judges to one, and mention was made of a further appeal to the House of Lords. The matter is so vital to surgeons that it may be hoped that the courts will leave them in no doubt how they stand. The value of the majority decision is that the lords justices have laid down that at any rate the leaving of a swab in the patient's body is not ipso-facto negligence on the part of the surgeon.

Thomas Mahon, son of the plaintiff, entered the hospital for an emergency operation for a perforated duodenal ulcer. He arrived at 3.45 A.M. and

the operation began within an hour. Certain difficulties were encountered through his taking the anæsthetic badly. Mr. Osborne, who was described in the evidence as a most careful and skilful surgeon, removed all the swabs of which he was aware. He asked the theatre sister whether all the swabs were accounted for; she replied in the affirmative. The surgeon, it was said, could have searched the whole of the abdomen to make certain that no swab had been overlooked; but it would have been wrong for him to cause further shock to the patient by doing so. A swab was left in Mahon's body and he died after a second operation. A special jury found a verdict against the surgeon, but added a rider that he was working in difficult circumstances in performing the operation.

Lord Justice SCOTT, who presided in the Court of Appeal, observed that the plaintiff's case had been presented as one of *res ipsa loquitur*. To put this principle in an elementary form for persons less versed in the law than the experts who listened in the court, one may mention the stock illustration alliteratively fixed in the mind of law students as the case of Byrne *v.* Boadle or the Bounding Barrel. A man is walking along a street pavement when a barrel suddenly leaps forth from a doorway and injures him. Barrels cannot behave like this unless someone has been at fault; *res ipsa loquitur* —the fact itself is eloquent. Mrs. Mahon's counsel presumably relied on the principle somewhat in the following fashion: the surgeon cuts open a patient and inserts foreign bodies inside him: the man who inserts these things is responsible for pulling them out again: swabs do not exist inside human beings unless there has been carelessness in leaving them there. Lord Justice SCOTT held that the principle *res ipsa loquitur* could not apply generally in actions of negligence against a surgeon for leaving a swab behind, though it was conceivable that in certain circumstances a presumption of negligence might be created. Before the principle could apply to the surgeon, there must be two presumptions of fact: first it must be presumed that the event was due to a breach by somebody of the duty of care towards the patient, and secondly it must be presumed that the surgeon was that somebody. The nature of abdominal operations, said the lord justice, varies widely, and many considerations arise. In the present case a state of things was presented of which the ordinary experience of mankind knew nothing; it was therefore unsafe to beg the question of proof. After Lord Justice MACKINNON had concurred, Lord Justice GODDARD delivered a dissenting judgment. An appeal from the verdict of a jury is not allowed merely because the appellate tribunal takes a different view of the facts from the view taken by the jury. The jury's verdict is not to be upset unless it is so fanciful that it ought never to have been given. If there is some evidence on which the verdict could have been reached, the verdict may stand. Lord Justice GODDARD thought that there was some evidence in the facts of this particular case on which a jury could conceivably have found as this jury did find, and that therefore the appeal should be dismissed.

Perhaps this minority judgment, depending on particular bits of evidence, is not of much general significance. Surgeons will be glad to have Lord Justice SCOTT's opinion that some positive evidence of neglect is necessary before the plaintiff can succeed. It may be that the full story of an operation will disclose facts sufficiently indicative of want of skill or care to entitle a jury to find neglect of duty towards the patient. Expert evidence may be necessary; but "to treat the maxim *res ipsa loquitur* as applying in every case where a swab is left in a patient seems to be an error of law." It is disappointing for Mr. Osborne that the majority opinions did not end in judgment being given in his favour on the ground that there was no evidence of his being at fault. The decision that there must be a new trial leaves him with a great deal of anxiety and expense to be faced a second time. The views of the Court of Appeal, however, permit him to face the further litigation at better advantage.

DEEPER DIVING

SINCE Augustus Siebe invented the first practical diving suit in 1819 many improvements have been introduced; but still the ordinary diving suit consists of an incompressible metal helmet and breast-plate and a flexible waterproof covering for the rest of the body. When submerged, the diver is connected with the surface by a life-line, a telephone cable, and an air hose, all of which are liable to endanger his life by getting entangled in wreckage or rocks. Though the entangled diver can cut his life-line and telephone, he can only cut his air hose if he proposes to make a rapid ascent from comparatively shallow depths. Even then he will probably suffer from caisson disease. Nor are these dangers purely theoretical, for it was reported by G. R. W. French in 1916 that during salvage operations on the sunken submarine F4 the divers were fouled in the wreck in almost 20 per cent. of the dives.

Caisson disease is not as easily avoidable as is generally supposed. The explanation of the cause given by Paul Bert in 1878—namely, the formation of nitrogen bubbles during too sudden decompression—has led to the use of slow decompression according to the tables of Boycott, Damant, and Haldane (1908), and the incidence of the trouble has much diminished. But caisson disease has not been eliminated, and the time lost in preventing it is in any case a serious factor; a diver who spends half an hour at a depth of 250 feet has to spend 3½ hours in decompressing. According to Shaw [1] the partial failure of this method is due to the incompleteness of Bert's explanation: erythrocyte agglutination is probably the primary disturbance,[2] though the formation of bubbles is a serious complication, and End [3] has observed that alkalinisation has a favourable influence. Even apart from caisson disease however there are other dangers in diving, and not the least of these is "squeeze."

1. Shaw, L. A., *J. industr. Hyg.* 1936, **18**, 486.
2. Swindle, P. F., *Amer. J. Physiol.* 1937, **120**, 59
3. End, E., *J. industr. Hyg.* 1938, **20**, 513.

A descent of about 2 feet increases the total pressure on the diver's body by about a ton. It is clear that if the pumps fail to maintain an increased pressure within the suit as the diver descends, as may happen if he falls suddenly under water, air will be squeezed from the compressible suit into the incompressible helmet. In extreme cases the man himself may be moulded into his own helmet. To these dangers of even moderate depths may be added the mental changes occasionally noted. Quickness of decision may be lost and it is recorded that a man once attempted to unscrew his face-plate, perhaps because of claustrophobia. Attempts to explain these changes on the supposition that nitrogen, acting in accordance with the Meyer-Overton law, behaves as a narcotic under pressure [4] have not been confirmed.

In such circumstances it is hardly surprising that efforts have often been made to design a safer diving suit, and in this attempt Mr. Nohl of Milwaukee has apparently succeeded (End [3]). The Nohl suit is self-contained, the air being carried in steel cylinders which take the place of the ordinary back-weights; there are thus no pumps or trailing hoses, and the wearer has a much increased freedom of movement. By carrying one cylinder of air and two of oxygen, and expiring into a soda-lime absorber, he can regulate as he descends not only the pressure within his suit but the composition of the air he breathes. Normally he is equipped with a life-line and a telephone cable; but, should he find it advisable to abandon these, he can rise to the surface in an orderly manner, stopping at intervals for decompression. Another recent improvement has been the substitution for air of helium-oxygen mixtures which allow decompression to take place in something between a third and a twenty-third of the usual time (End 1937). The Nohl suit makes possible the use of such mixtures and simplifies in other ingenious ways the tedious process of decompression. With these new methods Great Britain's diving record of 344 feet has been beaten with ease by Mr. Nohl, who has descended to a depth of 420 feet in Lake Michigan. (Indeed there seemed to be no reason to stop at this point apart from the inconvenient fact that he had reached the bottom, where he remained for 9 minutes.) The ascent took only 118 minutes, with longer pauses for decompression at thirty feet (pause of 22 minutes), twenty feet (28 minutes), and ten feet (46 minutes). At each stage Mr. Nohl emptied his diving suit and refilled it with pure oxygen, as advised by Shaw [1] and Behnke.[6] There were no mechanical faults or leakage of water, and the diver's mental and physical condition were excellent throughout the experiment.

ANNOTATIONS

AN EPIDEMIC OF TOXIC POLYNEURITIS

An outbreak of polyneuritis of obscure origin in Durban, South Africa, and district in the autumn of 1937 presented as pretty a problem of diagnosis as could be hoped for by the epidemiologist.[5] In all there were 41 cases scattered in ones and twos, chiefly at four foci in Durban and along the Natal coast. The typical story was that about twelve days after a mild gastro-enteritis painful stiffness or cramp began in the calf muscles and was replaced by paresis or paralysis of the muscles below the knees. Involvement of the intrinsic muscles of the hands usually followed, so that fine movements could not be performed. Occasionally the onset of paralysis was so sudden that patients either fell down in the street or were unable to stand on getting out of bed in the morning. This flaccid paralysis was very slow in clearing up and in many cases recovery is still not complete. The urine, blood and cerebrospinal fluid showed no significant changes and there was no rise of temperature or constitutional disturbance. Both Indians and Zulus were affected, as well as the white population, and there was no special class or age-incidence: the ratio of males to females was 9 to 1. The outbreak was at first thought to be one of atypical poliomyelitis, since it was argued that "a toxic food element could hardly affect people of all races and those with very dissimilar diets, unless it were operating through some such common vehicle as water, flour, sugar or tea, in which case a great number of persons would be likely to be affected."

News was next received from London that a similar outbreak had arisen among 27 out of the 34 passengers and crew of a French ship which had left Durban for Dunkirk via London on Oct. 2. The first cases on the ship began on Oct. 28, which would given an apparent incubation period of at least 26 days on the assumption that infection had taken place in Durban. Analyses of the provisions on the ship were made in Paris and no trace of arsenic was found. Meanwhile attention had been drawn to the similarity of this outbreak with the serious epidemic of paralysis which had begun in Oklahoma City in the United States in 1930 and had been traced to poisoning by tri-ortho-cresyl phosphate through the vehicle of essence of ginger—the so-called jake paralysis.[7] There was, however, no question of ginger essence being the toxic substance in the Durban outbreak, but eventually it was found that all the Indian and Zulu patients were connected with European kitchens, and that cooking oil said to be of a particular brand was common to the four principal foci. The Zulus affected had been in the habit of eating curry left over from the European meals, although at first sight their diet did not reveal anything which had been cooked in this oil. After initial failure, it was simultaneously reported by the government analyst at Durban and from the Ministry of Health in London that cresylic compounds had been found in soya-bean oil used for cooking in South Africa and on board the French ship, the *Jean L.D.*: how the oil came to be contaminated remains a mystery. A controlled experiment on cockerels in South Africa showed that the suspected oil was capable of producing paralysis of the same type as in the human cases.

The possibility of cases of paralysis of obscure origin being due to poisoning by tri-ortho-cresyl phosphate must be borne in mind in diagnosis.

4. Behnke, A. R., Thomson, R. M., and Motley, E. P., *Amer. J. Physiol.* 1935, **110**, 565.
5. Sampson, B. F., *Bull. Off. int. Hyg. publ.* 1938, **30**, 2601. Note presented by Dr. P. G. Stock, the delegate for the Union of South Africa.
6. Behnke and Shaw, *U.S. nav. med. Bull.* 1937, **35**, 61.
7. *Publ. Hlth Rep., Wash.* 1932, **47**, 2039.

Tri-cresyl phosphate is a colourless, almost odourless, and tasteless oily substance, and is not easily removed from the interior of containers, since it is insoluble in water and not volatile in steam. It is largely employed as a plasticiser for cellulose lacquers and varnishes and may also be found in abortifacient pills. Users of second-hand containers should take care that their cleansing processes are sufficient to ensure the removal of such substances.

THROMBOSIS AFTER HERNIOTOMY

OBSERVATIONS of postoperative thrombosis and embolism have failed to establish a direct causal relationship between the operation and the sequel. One of the correlations arising from such a relationship, did it exist, has been examined by Bergquist,[1] who recorded the side of the operation and the side of the thrombosis in the lower limb in 2900 herniotomies. In the whole series there were 88 examples of thrombosis and embolism, of which 35 had a thrombosis on the same side as the operation, 23 on the opposite side, and 30 had no recognised local thrombosis. The author concludes that this difference is not significant. The series was subdivided according to sex and type of hernia, and the largest subdivision consisted of 1309 operations for reducible right inguinal hernia in males, among which were 12 cases of right-sided and 12 of left-sided thrombosis, and 15 cases of embolism without recognised thrombosis. Nearly 3 per cent. of thrombosis and embolism is a high incidence for a simple operation, the more so as more than a third of the patients were under twenty. But a careful search for these complications always reveals more than are usually recognised, and the high incidence reported by some observers is probably more general than less careful records suggest. The difficulty of diagnosis is shown by the number of emboli that occur when thrombosis has escaped detection. The problem that Bergquist has studied is complicated by two observations: first, that in fatal cases of embolism the thrombosis is more commonly found on the right side, and secondly, that in all cases of recognised thrombosis the incidence is a little higher on the left than the right. There appears therefore to be a greater risk of embolism from a right-sided than from a left-sided embolism. Since hernia is about twice as common on the right side as on the left, a large series should show a slight preponderance of contralateral thrombosis rather than of ipsilateral as in Bergquist's series. It is doubtful, however, whether this consideration invalidates the author's conclusion that the evidence for a correlation between the side of operation and that of thrombosis is not statistically significant.

SUPERVOLTAGE X RADIATION

THE possibility that an improvement in the results of X-ray therapy may be expected as soon as more apparatus for the production of supervoltage X rays becomes available interests all who have to decide the policy of centres where cancer is treated. Lately Schmitz, Schmitz, and Sheehan,[2] of Chicago, have studied the effects of radiation at 800 kV on cancer of the uterine cervix. Repeated punch biopsies were taken from the cervix at stated intervals during treatment, and both macroscopic and microscopic changes were observed. The radiation was produced at 800 kV peak at 10 mA, with a filter equivalent to 10 mm. of copper, a focal skin distance of 70 or 86 cm., and a half-value layer of 8·2 mm. of copper. The output was 44 röntgens per min. measured with backscatter. Anterior and posterior fields were used and 4000 r was delivered to the skin in ten fractions at 48-hour intervals. This gave a dose of 4000 r throughout the true pelvis in an overall time of 28 days. Examination of the specimens obtained after receiving doses of 300, 1000, 2000, 3000, and 4000 r showed the familiar changes resulting from radiation, and an interesting attempt is made to differentiate between the reaction of those cells which tend to cornify and those which do not. The former when degenerate no longer take up dyes, and appear pale with giant nuclei and karyolysis. The latter are deeply stained with pyknotic nuclei, and form large squames without nuclei. These effects increase with dose, but the changes are not uniform, and again histological appearances cannot be accepted as a guide to probable lethal dosage. The authors suggest that half of the similar cases treated in another series by this method were clinically cured after four years, but they do not state whether the supplementary radium therapy that they mention had been given, nor are we told the number of cases in different clinical stages. In their present series, half the cases showed definite recurrence apparently within a short time—a result which is not surprising seeing that 4000 r in 28 days is probably a sublethal dose. The clinical value of this method is likely to lie in the ease with which a supplementary dose of 4000 r could be added at the lateral wall of the pelvis, where with the usual methods of radium therapy dosage is necessarily low.

1. Bergquist, B., *Acta chir. scand.* 1938, **81**, 555.
2. Schmitz, H., Schmitz, H. E., and Sheehan, J. F., *J. Amer. med. Ass.* Jan. 7, 1939, p. 17.

VACCINIA PROPAGATED IN HEN'S EGGS

THE desirability of obtaining vaccine lymph free from extraneous infective agents has prompted many attempts to propagate the virus in sterile culture media. The freedom of calf-lymph from bacteria has been to some extent achieved by storage and the addition of glycerol, but the varying degree of contamination of different samples of lymph and the fact that in storage the virus deteriorates, though less rapidly than the bacteria, make it highly desirable to obtain pure cultures of the virus.

In 1931 Rivers[1] described a method of growing vaccinia on minced chick embryo with Tyrode solution in flasks. In the following year Goodpasture, Woodruff, and Buddingh[2] were successful in infecting the embryonic membrane of the incubated hen's egg with the virus of vaccinia, and they obtained an initial inoculum free from bacteria by passage through the testis of the rabbit. Stevenson and Butler,[3] working at the Government Lymph Establishment, made their first observations on culture in eggs in 1933, and they have now[4] published the details of their methods and the results of their later work. They describe the characters of the cultured virus, its slight lethal action on the embryo, its potency for infecting rabbits, its harmlessness, and its stability during passage in eggs. They have fully studied the keeping properties of the vaccine pulp and the technique of preservation. Some workers have found that vaccinia strains grown in chick embryos cause hæmorrhagic and necrotic lesions on the skin of mammals, but Stevenson and Butler are convinced that this property is mainly confined to strains which have been passaged through the testis. They lay great

1. Rivers, T. M., *J. exp. Med.* 1931, **54**, 431.
2. Goodpasture, E. W., Woodruff, A. M., and Buddingh, G. J., *Amer. J. Path.* 1932, **8**, 271.
3. Stevenson, W. D. H., and Butler, G. G., *Lancet*, 1933, **2**, 228.
4. Stevenson and Butler, *Rep. publ. Hlth med. Subj., Lond.* 1939, No. 87.

stress on the differences between strains of vaccinia virus and on the importance of using a purely dermal strain as the source for chick-membrane culture. They obtained the initial virus free from bacteria by inoculating a good dermal strain intradermally on a rabbit and collecting the virus from the under surface of the skin. They used the skin of young rabbits for titrating the virus, for the chick membrane in eggs was too variable as a culture medium for this purpose. The lethal property of their strain for chick embryo was very low. Eggs inoculated about the fourteenth day of incubation were opened for removal of the culture four days later and the embryo was seldom dead; live and healthy chicks were occasionally hatched out of the infected eggs. The potency of their virus varied little from the 2nd to the 105th egg passage. They reproduce photographs of the cultures on chick membranes showing papules and plaques of vaccinia sometimes as large as half a crown.

Stevenson and Butler are satisfied with the trials of their chick-membrane virus on human beings and quote the work of Goodpasture and Buddingh [5] who performed 936 primary vaccinations with 93·6 per cent. takes and no complications. They believe that the use of chick-membrane vaccine derived from their dermal strain will be as safe as fully purified calf-lymph, but they think that it should first be used on small numbers by experienced vaccinators who should keep careful records. They maintain that it is a great advantage that this lymph is free from bacteria when collected and that its production would entail much less work and expense than calf-lymph.

SULPHANILAMIDE CYANOSIS

THE commonest toxic effect of the sulphonamide compounds, apart from such minor ones as nausea and depression, is cyanosis. It has been very variously regarded in the past, some viewing it with alarm and others ignoring it altogether; but today, except in patients already subject to anoxæmia from some other cause, it is considered an often necessary evil and no bar to further treatment. The mechanism by which this cyanosis is produced is by no means fully understood, but there seem to be three different causes. The first is absorption by the red cells of a coloured derivative of sulphanilamide; the second and third are methæmoglobinæmia and sulphæmoglobinæmia, the former resulting from the first stage of a process that in the presence of H_2S may go on to the establishment of the latter. Hartmann, Perley, and Barnett [6] have made an extensive study of methæmoglobinæmia following the administration of sulphanilamide. They found some degree of it in almost every patient receiving the drug, but the rate of its appearance and its amount varied widely and inexplicably; a scatter diagram plotting the methæmoglobin and sulphanilamide concentrations in the blood of a number of patients shows a correlation between them which is far from constant. In individual patients on the other hand there was such correlation at different times, and it was noted that those forming a disproportionately large amount of methæmoglobin were often those with severe infection and high fever. The same investigators have also studied the treatment of methæmoglobinæmia with methylene-blue, a procedure originally suggested by W. B. Wendel (in 1937) although based on previous observations by F. Hauschild and others. Methylene-blue has been shown greatly to accelerate the reconversion of methæmoglobin to hæmoglobin in poisoning by various aniline derivatives. Its effect in methæmoglobinæmia due to sulphanilamide is dramatic, the cyanosis disappearing within half an hour when a dose of 1–2 mg. of the dye per kilogramme of body-weight is given intravenously; but the formation of methæmoglobin is soon resumed, and the status quo is reached in about 24 hours. Thus a single dose gives only temporary relief—though it also gives the opportunity of observing whether the cyanosis is due to methæmoglobinæmia and not due to some other cause—but the methæmoglobin level can be kept down by continuing administration of the dye by the mouth, or prevented from ever rising unduly if methylene-blue is given together with sulphanilamide from the start of treatment. The dye itself is believed to be harmless in the doses required, and there is no indication that it interferes in any way with the therapeutic action of sulphanilamide.

5. Goodpasture, Buddingh, Richardson, L., and Anderson, K., *Amer. J. Hyg.* 1935, **21**, 319.
6. Hartmann, A. F., Perley, A. M., and Barnett, H. L., *J. clin Invest.* 1938, **17**, 699.

HOW FAR CANCER IS NOW TREATED ADEQUATELY

IN seeking parliamentary powers to secure the extension of the present facilities for the treatment of patients suffering from cancer, Mr. Walter Elliot has no doubt been influenced by the figures contained in a report published by the Ministry of Health today.[1] Its author, Dr. Sholto Mackenzie, has tried by means of a sampling inquiry to assess the extent to which cancer patients receive treatment under present conditions, the Radium Commission having concluded, in its seventh annual report, that the facilities already provided or contemplated are inadequate. Estimates made by the Ministry confirmed this view but it was thought well to attempt a more direct assessment. For this purpose eleven county boroughs and eight county areas were selected, the former including some towns with radium centres, others with progressive ideas and modern hospitals, and some smaller country towns, the latter including rural, industrial, and dormitory types. By collaboration with the medical officers of health histories were obtained of as many persons as possible who were certified as having died from cancer during the first six months of 1936. By such means 3303 histories were secured, and these appear to be properly representative of all cancer deaths in England and Wales at that date, judged by the distribution of the sites involved, the sex ratio of the mortality, and the average age at death. On the other hand the inquiry deals only with the dead—i.e., the failures—so that for those sites which can be successfully treated the picture may well be overdrawn.

Of the 3303 patients, as many as 2420, or 73 per cent., were assessed as untreated, in spite of the somewhat generous definition of treatment—for example, all patients who received radiation were recorded as treated although the aim may sometimes have been merely palliative. This large body of untreated persons may be divided into three broad groups—namely, 513 patients who suffered from cancer of organs for which treatment, even under the most favourable conditions, is not possible (e.g., pancreas, lung, and œsophagus); 1604 for whom treatment is theoretically practicable provided they attend for advice at a sufficiently early stage (e.g., stomach, intestine, and larynx); and 303 particularly amenable to treatment (e.g., uterus, breast, and skin). Taking the last two groups together as

1. Cancer. An inquiry into the extent to which patients receive treatment. By the Hon. Sholto Mackenzie, M.D. H.M. Stationery Office. 1939. Pp. 41. 9*d*.

indicative of the field in which extended facilities for treatment might operate, it is found that of these 1907 untreated persons, 418 (22 per cent.) were not treated because they were virtually moribund when they first sought advice; 169 (9 per cent.) because they suffered from concomitant disease; 426 (22 per cent.) on account, probably, of their advanced age; 657 (34 per cent.) because apparently when first seen their condition was too advanced for treatment; and the remaining 237 (12 per cent.) because they refused treatment. Even with the treatable organs 16 per cent. of the patients were in too advanced a stage of the disease for treatment, but the limitation of the sample to the dead may give too gloomy a picture here. Special study is made of 283 patients in the most treatable group, that is, with cancer of the breast, uterus, skin, tongue and mouth parts, who resided in eight of the areas of investigation. Only a little more than a quarter of them had been treated in hospitals known to have facilities for radiation treatment, another 17 per cent. in hospitals with some radiation facilities, and 11 per cent. in hospitals with no such facilities. For nearly one patient in five in this important group no reason for lack of treatment was given except the advanced stage of the disease, and it is probable that they would all have been suitable for treatment had they sought it earlier.

From such figures Sir Arthur MacNalty deduced, in his preface to the report, two guiding principles, relating mainly to those organs in which treatment has made much progress in recent years. "They consist," he says, "in attempting to secure not only that more patients receive treatment, but also more patients receive treatment at an earlier stage, when it is likely to be more effective. An attempt to fulfil these needs connotes wider provision of facilities for treatment and for early diagnosis." To what extent such wider provision may be effective remains to be seen. It can hardly operate within the 25 per cent. of the patients who, according to this investigation, refuse treatment altogether or are debarred treatment on the grounds of age or the presence of concomitant disease. Its success must lie rather in the large proportion seen too late for effective treatment or seen only in inadequately equipped hospitals. The former must denote that with wider facilities patients will tend to come for treatment at an earlier stage of disease, and the present inquiry provides no evidence on that point. The latter clearly raises the question of the wider provision not only of the means of treatment, surgical or radiological, but also of personnel fully competent to use it effectively and to adapt their methods to any and every development in our knowledge. Dr. Mackenzie's careful report undoubtedly clears the ground.

CONSTRUCTIVE A.R.P.

PERHAPS there have never been so many opportunities for making the best of a bad job as there are today. Ugly necessity is forcing us to spend a great deal of money on preparations for calamity; but wise planning will allow us to ensure that some of it, at least, is used to make positive contributions to the nation's health and happiness. The Government's proposal to finance a £1,000,000 scheme to build camps for school-children is an example of this kind of constructive defence. The camps will be a valuable supplement to any evacuation scheme in war-time, while in peace-time they would serve as school camps for town children and as holiday centres for young workers; their construction will give employment to many. In a written reply to a question in the House of Commons on Feb. 13 Sir John Anderson announced that it is proposed to build 50 of these camps, each to accommodate 350 children. They will be composed of huts which will be supplied with central heating, water, electricity, and main drainage. There will also be at each camp a common dining-room, recreation-rooms, and a number of covered shelters. It is proposed to set up two public corporations, one for England and Wales and one for Scotland, to administer the scheme. They will be expected to recover 50 per cent. of the capital and to meet all maintenance charges from peace-time letting of the camps, but it is emphasised that the camps will not be run to make a profit.

POSTOPERATIVE CIRCULATORY FAILURE

FACED with postoperative collapse our first concern must be to decide whether the failure of circulation is peripheral or cardiac or both. The importance of this distinction is by no means always appreciated, and unexpected deaths from postoperative shock are too apt to be put down to myocardial insufficiency though there is no real evidence of it. As Wood [1] remarked in a recent analysis of the cardiac complications of major abdominal surgery, in the absence of an autopsy it is often difficult to convince the surgeon that the heart is innocent. Sir Hugh Devine [2] emphasises the value of careful preoperative examination of the cardiovascular system, for the probabilities in diagnosis are very different in a patient who came to operation with a normal circulatory mechanism and in one who was suffering from some "crippling" of the heart. Devine would like every patient who is to undergo a serious operation to have an electrocardiographic and radiographic examination, for he regards coronary sclerosis and myocardial degeneration, which may be missed on ordinary clinical examination, as of particularly bad import. The essential difference between cardiac and peripheral circulatory failure is that in the former the venous pressure is raised and in the latter it is depressed. The arterial blood-pressure is not much affected in the early stages of heart-failure, except in the more sudden catastrophes, whereas in peripheral failure there is always an obvious fall. The patient with cardiac failure usually wants to sit up in bed, and the arm and neck veins are noticeably distended. The shocked patient on the other hand sinks down in the bed, and the veins are collapsed. The most probable causes of very sudden circulatory distress are pulmonary embolism and myocardial infarction. A gradual failure is more likely to be a manifestation of surgical shock, hæmorrhage, or an intra-abdominal complication such as peritonitis or ileus. Primary postoperative shock—the type that develops during the course of an operation—is to a great extent preventable. The amount of shock produced depends largely on the technique of the surgeon and the type of anæsthetic given, and the administration of fluid before and during the operation may anticipate and obviate mishaps. The collapse that happens hours later is supposed to have a toxic rather than a neurogenic origin. In such cases, Devine thinks, there is evidence to warrant the use of Sympatol, a synthetic adrenaline that is said to have a more prolonged effect than ordinary adrenaline and can be given intravenously in larger doses. But the first essential is to give fluids intravenously or rectally by the drip method until all signs of dehydration have disappeared.

1. Wood, P., *Proc. R. Soc. Med.* 1938, **31**, 676.
2. Devine, H., *Aust. N.Z. J. Surg.* 1938, **8**, 145.

For true cardiac failure Coramine, Cardiazol, caffeine and digitalin are the usual drugs, and one or other may be given with the fluids when it is felt that a crippled heart is adding to the circulatory embarrassment of surgical shock. For various mechanical reasons an abdominal operation may be dangerous for a patient with an impaired circulation. The peristaltic and pendulum movements of the intestines normally aid the return of blood to the right side of the heart, and these may stop altogether after a serious abdominal operation. Diaphragmatic action may also be impeded by upper abdominal operations and inflammations, and bandaging of the lower ribs may embarrass chest movements. Physicians are constantly impressing on surgeons, however, that the most serious operation will not cause failure in a healthy heart, and that even a diseased heart stands up to surgical strain remarkably well.

STORED BLOOD FOR TRANSFUSION

BLOOD has for some years been stored for purposes of transfusion in Russia, Spain and America, but until recently only fresh blood has been used in this country. The international crisis last September, however, stimulated considerable interest in the possibilities of this method. On the whole human placentas have not found favour here as a source of blood though their use is advocated by some workers such as Howkins and Brewer,[1] Page, Seager and Ward,[2] and Halbrecht.[3] Cadaver blood has not been studied, but it is clear from articles in our present issue and from a discussion in the section of therapeutics and pharmacology of the Royal Society of Medicine on Feb. 14 that blood withdrawn from adult donors may be stored with little trouble and is suitable for all types of patient. Such stored blood has been given with satisfactory therapeutic results, as evidenced by rise in red cells and hæmoglobin and improvement in general condition, in a wide variety of conditions including postoperative shock, anæmias due to chronic and acute hæmorrhage, and various blood diseases. Dr. G. A. Elliott and his colleagues, who gave 50 such transfusions, and Dr. E. M. C. Biddle, who has given 150, believe that reactions are less common after stored than after fresh blood. It seems possible that the rather high reaction-rate reported from Spain by R. S. Saxton was due to defective storage dependent on war conditions.

The majority of workers in the past have used sodium citrate as a preservative at a final concentration of about 0·38 per cent., but both Elliott and his colleagues and Dr. C. R. Boland advocate the use of I.H.T., a solution devised by the Moscow Institute of Hæmatology, which is mixed with the blood in equal quantities. Such high dilution seems an advantage since all stored blood tends to become sticky. Glucose citrate, and citrate in normal saline may also be used. Temperatures between 1° and 7° C. are satisfactory for storage but blood must under no circumstances be frozen because this results in complete hæmolysis. It is essential also to avoid agitation of the blood as far as possible, a point which Saxton thought an objection to the special flask used in Spain. There the blood was stored with a high pressure of filtered air, which facilitated the administration of the blood but was liable in Saxton's opinion to lead to less satisfactory preservation. Blood can be stored for a fortnight with no loss of therapeutic value and may be kept for as long as 34 days, but generally it should not be used when older than three weeks. Administration may be carried out by gravity pressure or the drip method as long as the blood is filtered before use. Apart from questions of apparatus and technique it is clear that the possibilities of stored blood have been too long neglected in this country. An organisation of blood banks will in future be an essential part of peace-time as well as of war-time medicine, so that blood already tested for sterility and Wassermann reaction will always be immediately available. Such a service is far more satisfactory for the donors, who can come up to give blood at a time convenient to themselves instead of being snatched from bed or work by an urgent call, and is often life-saving for the patient with sudden severe hæmorrhage. If the magnificent blood-transfusion centres in Republican Spain, where blood was withdrawn, tested, and prepared for use, were possible there in time of war they should be equally possible in England in times of peace.

1. Howkins, J., and Brewer, H. F., *Lancet*, Jan. 21, p. 132.
2. Page, A. P. M., Seager, K. G., and Ward, E. M., *Ibid*, Jan. 28, p. 200.
3. Halbrecht, J., *Ibid*, p. 202.

We regret to announce the death on Wednesday morning of Mr. G. J. JENKINS, ear, nose and throat surgeon to Lambeth and St. Charles' Hospitals.

Prof. W. SCHULEMANN of the pharmacological institute of the University of Bonn will lecture on chemotherapy at the Wellcome Research Institution, Euston Road, London, N.W.1, on March 7, 8, and 9 at 5.30 P.M. and Dr. W. E. GYE, F.R.S., director of the Imperial Cancer Research Fund, will speak on the present position of the cancer problem at St. Thomas's Hospital medical school on March 20, at 5 P.M. These lectures are being held under the auspices of the University of London, and all who are interested are invited to attend.

Mr. CEDRIC LANE-ROBERTS will deliver the Hunterian oration to the Hunterian Society at the Mansion House, London, E.C.4, on Monday, Feb. 27, at 9 P.M. He will make a plea for the woman in gynæcology and obstetrics.

Major-General H. E. M. DOUGLAS, A.M.S.(retd.), who died at Droitwich on Tuesday at the age of 63, was awarded the Victoria Cross in 1899 at Magersfontein when, although himself wounded, he advanced under heavy fire to give first-aid to many who had been hit and were lying helpless in the open. Later he became deputy-director of medical services for the Scottish Command in Edinburgh.

Mr. Michael Kineally, teacher at Ring College, co. Waterford, is claiming damages in Dublin High Court on the plea that his daughter died from tuberculosis after being inoculated against diphtheria by Dr. D. T. McCarthy of Dungarvan with T.A.F. prepared by the Wellcome Foundation. On Tuesday Dr. McCarthy was dismissed from the case with costs and Mr. Justice Maguire allowed the action against the Wellcome Foundation to go to the jury. An account of the inquest held two years ago will be found in THE LANCET, 1937, **1**, 1305 and 1480.

POSTGRADUATE MEDICAL COURSES IN ITALY.—Courses for medical graduates from abroad on the latest developments of Italian medical science will be held in Rome from June 5 to June 17, and then in Bologna, Pavia and Milan until the 22nd.

A course in phthisiology will be held from July 15 to Oct. 15 at the Carlo Forlanini Institute in Rome, and an international malaria course from July 24 to Sept. 20 at the Ettore Marchiafava Institute of Malariology in Rome. Further information may be had from the medical and health department of the National Institute for Cultural Relations with Foreign Countries, Via Lazzaro Spallanzani 1A, Rome.

SPECIAL ARTICLES

THE BLOOD-TEST ON TRIAL

THE Bastardy (Blood Tests) Bill has attained a second reading and now stands referred to a select committee of the House of Lords. Its welcome from the Government was disappointingly tepid. If the Lord Chancellor and the Home Office are unaware that perjury is scandalously rife in paternity proceedings, many ordinary folk could enlighten them. Incidents like the Batchelor case are no occasion for olympian unconcern. At Kent assizes a few years ago the mother of a child was convicted and sentenced for perjury after the man whom she had falsely accused of being the father had gone to prison no fewer than nineteen times in three years because he refused to pay the weekly sum which her false evidence had persuaded the magistrates to impose upon him. It is true that the compulsory blood-test can do no more than prove a negative and that its value is limited to a moderate percentage of cases. But if injustice can be eliminated even on a small scale, those who are responsible for our forensic system might give the country the benefit of the opportunity. We have few judges more eminent than Lord Atkin, perhaps none who combine so high an authority in jurisprudence with so practical an experience of personal work at petty and quarter sessions. This, said Lord Atkin last week, is a bill which gives the most powerful and conclusive aid to courts of justice in one of the most difficult matters with which they have to deal. The Lord Chancellor enumerated the points which the select committee will be able to elucidate—the proportion of cases in which the test will be useful, the risk of error, the certainty of identifying the persons tested and the total cost likely to be thrown upon public funds. There can be no objection to full investigation provided that the zeal for knowledge is not permitted to postpone indefinitely the serious consideration of the bill.

Last week's debate may at any rate have removed certain misunderstandings. Lord Gorell, who moved the rejection of the bill, stated that there were very few people in the country today who were competent to perform the tests. He seemed ready to convey the impression that the scientific significance of blood-groups for this purpose has neither been adequately studied nor solidly established. Lord Dawson of Penn was able to remind him that at every teaching centre and at every first-class hospital there are pathologists who are perfectly competent to conduct these tests, and that there is hardly a subject of medicine which has been so thoroughly examined in the study. Home Office experts, according to the Lord Chancellor, advise that, where a test has shown that the putative father cannot have been the actual father, a second independent test should be made as an additional check. This suggestion, obviously a point for the select committee, surely cannot arise from any doubt among experts of the conclusions of blood-group research. It must originate either in the fear that it is beyond the power of our administrative officials to devise fool-proof machinery or in the belief that the public and the magistrates cannot appreciate the lessons which research can teach. The risk of error in a properly devised scheme would be almost negligible. If error did creep in, it would be far outweighed by the additional security of defendants against injustice. The education of the public and the magistrates is a process in which our governors might be willing to lead rather than to follow. Last year, it may be recalled, the Home Secretary was asked by Sir E. Graham-Little, M.P., whether he would consider circularising magistrates on the subject of the validity and value of blood-tests. In giving a negative reply, Sir Samuel Hoare said he thought the courts were already aware of the possibilities and value of the tests to which full publicity had been given. It would be surprising, however, if more could not be done to bring the system to the notice of magistrates. In the popular mind perhaps scientific research is still associated almost exclusively with the combination of a few simple chemicals to produce a visible explosion. Nor is distrust of the microscope confined to the ordinary citizen. There was a historic case in 1857 at Taunton assizes when a man was charged with murder and a bloodstained knife had been found upon him. He said he had used it for cutting beef. The crown offered scientific evidence that coagulation must have taken place on the knife-blade; in other words, the knife must have been in contact with living blood; secondly, evidence of the relative sizes of the corpuscles in the blood on the knife indicated that it could not have come from an ox, sheep or pig; the corpuscles were too small; their size agreed with that of human blood. Lord Chief Justice Cockburn observed that "admitting the great advantages of science we are coming to great niceties indeed when we speculate upon things almost beyond conception." He advised the jury not to convict on this scientific speculation alone.

Our courts seem sometimes still to be living in the eighteen-fifties. The old prejudice against circumstantial evidence survives. Corroboration by the microscope of the putative father's denial is not felt to be so good as corroboration of the girl's story by someone who saw John and Mary walking out one evening in a lane. Gradually, we must hope, the certainty of the results of blood-tests will establish itself in the popular mind. Our judges are not all Cockburns. "I agree," said Lord Atkin last week, "that this bill goes only to a proportion—call it a small proportion—of the cases that are heard; but, in the smallest proportion of cases, if in fact you can make sure that the man is not the father, then that is an immense addition to the equipment of justice in this country."

MILK AND DISEASE

A DEPUTATION TO THE MINISTRY OF HEALTH

ON Feb. 8 Mr. WALTER ELLIOT (Minister of Health) and the Earl of FEVERSHAM (parliamentary secretary to the Ministry of Agriculture), with a representative of the Department of Health for Scotland, received a deputation on the need for adequate safeguards for the milk-supply. The members were Sir Kaye Le Fleming and Prof. R. M. F. Picken (respectively chairman of council and chairman of the public health committee of the British Medical Association); Prof. G. S. Wilson (Royal College of Physicians); Prof. Ernest Hey Groves (Royal College of Surgeons); Sir William Savage and Dr. Thomas Orr (Society of Medical Officers of Health); and Dr. C. O. Hawthorne and Dr. J. B. McDougall (Joint Tuberculosis Council).

Sir KAYE LE FLEMING, who introduced the deputation, said that the medical profession were aware

that there was a considerable amount of unsafe milk which was the cause of preventable disease, and it was their opinion that effective pasteurisation offered the most practical means of securing safety.

Prof. R. M. F. PICKEN recalled that the B.M.A.'s milk policy had been before the representative body for three years in succession and only once had there been so much as one dissentient. Complete unanimity was not to be expected of a profession composed of 45,000 individualists, but he knew of no other subject on which doctors were so nearly unanimous. Moreover, they had refrained from advocacy of pasteurisation until they had satisfied themselves as to any effect it might have on the nutritive quality of the milk. After referring to the hesitation which the profession must often feel in recommending milk under present conditions, he said that until milk that was at once safe and palatable was generally available no further substantial increase in consumption could be expected. The provisions contained in part VII of the Milk Industry Bill had been welcomed, although some of the safeguards which it had been thought necessary to include were unwelcome. The deputation hoped that, whether by a new Milk Bill or through other legislation, power would be given to local authorities to exclude from sale all milk, other than milk from tuberculin-tested herds, which was not pasteurised or otherwise rendered safe by some form of heat treatment.

Sir WILLIAM SAVAGE said that the Society of Medical Officers of Health had been passing resolutions on the subject since 1932. So far as the milk-supply was concerned, no local authority was at present in a position to carry out its statutory obligations in regard to health. Analysing part VII of the bill now withdrawn, he said that uneasiness had been felt by the society over the provisions relating to accredited milk, the five years' interval before the pasteurisation requirement could have become effective in the case of producer-retailers, the undesirability of repeated discussion of the dangers of a raw milk-supply at a succession of public inquiries in different areas, and the requirement that individual pasteurisation orders under the bill should be laid before Parliament.

Prof. G. S. WILSON pointed out that as long as five years ago, when the Government was considering the milk-in-schools scheme, the Royal College of Physicians had formulated its views as to the steps that might be taken to ensure safe milk-supplies generally. Since then, it was estimated, there had been 10,000 deaths due to tuberculosis of bovine origin, and some 2000 cases of undulant fever. In addition, there had been sixteen epidemics of milk-borne diseases, which had affected about 3400 persons and had caused at least 67 deaths. There was, he contended, no other legislative action which the Minister could take which would be as surely reflected in mortality figures as would legislation to protect the milk-supply.

Discussing the nutritive value of pasteurised milk, Prof. Wilson stated that in the course of nine comparative experiments conducted in this country during the past few years some 250 calves had been divided into approximately equal groups reared on raw and on pasteurised milk. Taking all these experiments together, no statistical difference had been found in the growth-rate, although the advantage, such as it was, rested with the calves reared on pasteurised milk. Experiments performed with mice, rats, calves, and human beings all combined to show that the damage done to the nutritive value of milk by pasteurisation was for practical purposes negligible. Pasteurisation requirements were already in operation in a number of cities in the United States and Canada and would come into force for the whole province of Ontario in June, and for the whole of Sweden in July of this year. In France also legislation had already been passed. All that was asked was that this country should not lag behind.

Dr. C. O. HAWTHORNE expressed the disappointment of physicians whose daily concern was with tuberculosis and whose hopes had been aroused by the fair promise of the Government's white paper.

Mr. WALTER ELLIOT, in reply, said that the deputation would not expect him to anticipate the new legislation which Mr. Ramsbotham had stated in the House would be introduced. He and Lord Feversham had taken careful note of the representations made by the deputation on behalf of the medical profession and he could assure them that they would be borne in mind when he and the Minister of Agriculture came to discuss the provisions to be included in the promised legislation.

SCOTLAND

(FROM OUR OWN CORRESPONDENTS)

EDINBURGH SURGICAL CHAIR

Prof. J. R. Learmonth has accepted the call to fill the chair of surgery left vacant by the death of Sir David Wilkie, and what is Aberdeen's loss is Edinburgh's gain. After graduating at Glasgow in 1921 Learmonth became assistant to Prof. Archibald Young, with whom he continued to work, first at the Anderson College and later at the University of Glasgow, till 1928 when he joined the surgical staff of the Mayo Clinic where he had already spent a year as Rockefeller research fellow; with this appointment he held the title of associate professor of neurologic surgery in the University of Minnesota. After making a prolonged study of the surgery of the brain and of the spinal cord and paying special attention to the neuralgias, Learmonth returned to Scotland in 1932 to succeed Sir John Marnoch as regius professor of surgery at Aberdeen. He is surgeon to the King in Scotland.

ABERDEEN ROYAL INFIRMARY

The directors of the infirmary are to build a fee-paying block at Forresterhill for at least 50 patients. The new building, which has been made possible by a bequest of over £50,000, is expected to be ready for occupation within a year. It will provide treatment for those of moderate means and for those who can pay but who need specialised treatment which they cannot obtain elsewhere. It was stated at the meeting of directors that the increasing number of patients who were seeking admission made it necessary for voluntary hospitals to modify their policy of treatment without discrimination. Admission to the new home will be restricted to those within an income limit, not yet defined, and to their dependants.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE.—The annual malaria-control course for laymen will be held at the school (Keppel Street, W.C.1) from June 26 to 30 under the direction of Sir Malcolm Watson. Additional lectures have been arranged on water-supplies, conservancy and sewage-disposal, insulation against heat and cold, and air-conditioning for comfort in the tropics. Further particulars may be had from the organising secretary of the Ross Institute of Tropical Medicine at the school.

THE AIR-RAID

A series of articles on medical organisation and surgical practice in air attack by
P. H. MITCHINER, C.B.E., T.D., F.R.C.S., *and* E. M. COWELL, D.S.O., T.D., F.R.C.S.

VII—WOUNDS OF BONES AND JOINTS

THE general principles of the treatment of wounds involving bones and joints are essentially the same as those of wounds in any other region—namely, the thorough exploration and excision of the wound at an early date, removal of missile and shreds, and subsequent rest of the area to allay pain, to promote healing, and to minimise the risk of infection. Bone injuries take the form of compound fractures, usually comminuted; joints are either penetrated by small fragments, or there is considerable damage to the bones whose ends articulate in the damaged joint cavity. In both classes of injury the aim of the surgeon is primarily to prevent infection and secondarily to put the limb in such a state and position that the patient can be transported safely in the immediate future. For this reason all extensions applied must be of the fixed type, and limbs must be secured parallel to the trunk to allow of transport on stretchers and in ambulances.

INJURIES TO BONES

Many *simple fractures* are likely to be met with as a result of falling masonry. Their treatment in no way differs from that given in ordinary surgical practice and will not be described in this article. The surgeon should remember, however, that the patient may be in transit from one hospital to another for several hours, when splints and dressings cannot be looked at, and for this reason plaster bandages should be used with caution. When these cases are admitted to a casualty hospital, the splints should be adjusted as necessary and the patient evacuated as soon as possible to a base hospital set aside for such cases, where radiograms can be taken and adequate treatment given. Only in those cases in which there is great pain or obvious interference with circulation should the splints be removed and the fracture readjusted at the casualty clearing hospital.

Compound fractures will be most commonly due to wounds from shells and bombs but are also caused by machine-gun bullets and shrapnel. In most cases the soft parts are very much disorganised, and in penetrating wounds the wound of exit is usually large, with fragments of bone and disorganised muscle protruding from it. The bone is often severely comminuted, or large pieces of bone may be completely missing. The nature of the injury is obvious in all cases.

To allay pain and prevent shock it is essential that *first-aid treatment* to secure fixation of the fractured bone ends should be carried out early and efficiently. For this purpose it is best to apply extension splinting (a Thomas splint in the case of the lower limb) without removing the patient's clothing, except in so far as it is necessary to cut it away to expose and dress the wound. In the case of the upper limb no satisfactory extension splint is available which will allow carriage on a stretcher, and it is better for the limb to be bandaged to the side, while the forearm is supported either in an arm-sling or collar-and-cuff suspender.

On arrival *at the casualty hospital* these patients should, if possible, be radiographed as a routine before being passed through the operating theatre. Thus both the extent of the damage and the situation of retained missiles can be ascertained. Treatment of the wound differs in no way from that already described—i.e., complete excision of all damaged tissue. The bone ends must be carefully exposed and thoroughly curetted, especially on the broken surfaces, and loose fragments must be removed. There is considerable vitality in bone so long as the attached muscle is intact, and fragments attached to undamaged muscle should be replaced rather than excised. Projectiles in the immediate vicinity of the wound are better removed, for in the case of bomb wounds they often carry fragments of clothing with them, but here, as in other cases, no prolonged search opening up undamaged tissues should be carried out for deeply buried fragments. No reliance should be placed on antiseptics, *débridement* or scrubbing with soap and water.

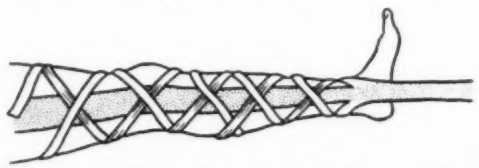

FIG. 1—Longitudinal strips of adhesive plaster reinforced with slanting strips preparatory to the application of a Thomas splint.

In all *lower-limb fractures* the limb should be placed in a Thomas splint with extension of the fixed type to the cross bar to allow of transport. These extensions may with advantage be taken from a Steinmann's pin, inserted when feasible through the lower end of the fractured bone, well securing the damaged tissues. Before inserting this pin the surgeon must draw the skin well up the leg, and during its insertion he must guard against traversing the joint cavity. A suitable calliper is then attached over the ends of the pin, and extension can be taken from this to the end of the Thomas splint. A second satisfactory method, which can be carried out by orderlies, is the application of longitudinal strips of adhesive plaster attached to the limb below the fracture. The limb must be shaved before applying this plaster. No circular bands must be placed round the limb, but slanting strips may be used to reinforce the attachment of the longitudinal strips (fig. 1). If necessary, the lower ends of the two strips of plaster may be attached direct to the bar of the splint, or a wooden spreader may be inserted between them and double cords passed through these and secured to the lower end. These cords can then be tightened by the insertion and twisting of a piece of wood (Spanish windlass), which can be secured to the lower end of the longitudinal bars of the splint when sufficient traction has been secured (fig. 2). It is advisable to close the wound only if this can be done without tension; otherwise it should be left open and dressed with hypertonic saline or acriflavine in oleum ricini. The patient, when he has recovered from the anæsthetic, should be transferred as soon as possible to a base hospital for fracture cases, only being retained at the casualty hospital if he needs treatment for shock or if hæmorrhage is anticipated.

In *upper-limb fractures* no satisfactory extension splint exists which will permit of transport. The Thomas abduction splint is dangerous if the arm

is brought to the side, for it impedes the circulation in the limb, and Robert Jones's modification is difficult to adjust satisfactorily and extremely liable to slip in transit. It is therefore better to secure these fractures with either slats of plaster-of-paris or Kramer's wire splinting, the upper part of the

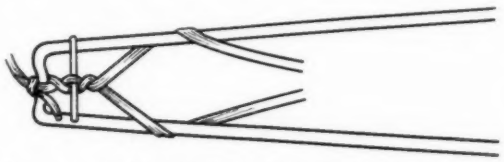

FIG. 2—Spanish windlass for maintaining "fixed" extension when a Thomas splint is used.

limb being then bandaged firmly to the patient's side after a suitable dressing has been applied to any wound present. It is therefore unnecessary and unfeasible to apply extensions at this stage of treatment, provided the patient can be rapidly transported to a fracture hospital at the base.

It is not intended to deal here with fractures of special bones, for the general principles of treatment at this stage apply to all fractures irrespective of what bones are involved. In fractures of the ribs and pelvis careful examination must be made to exclude the possibility of damage to the thoracic and abdominal cavities and their contents.

TREATMENT OF COMPOUND FRACTURES IN SPAIN

In Spain, after thorough excision of the wound and *débridement* of fragments of damaged bone, the whole limb is encased in plaster-of-paris. Bomb wounds of the upper part of the humerus are put up in thoracobrachial plasters ("aeroplane splints"). In the later stages of healing the patients walk about and are very comfortable. In bomb wounds involving femur and leg bones skeletal traction is used with Böhler's apparatus, the weight extension being

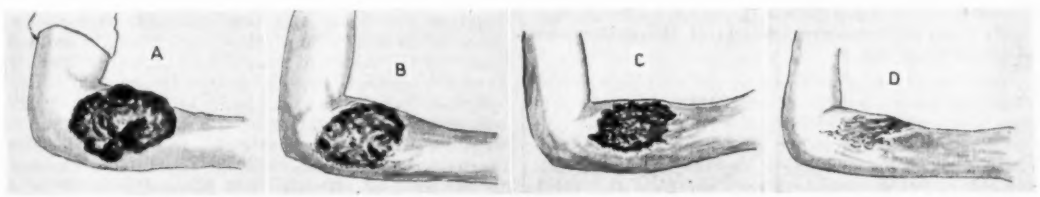

FIG. 3—Compound fracture of forearm treated by plaster method. A, sepsis already established before application of windowless plaster; B, wound healing on first removal of plaster a fortnight later; C, wound at second dressing yet another fortnight later; D, wound at third dressing, 45 days after start of treatment, granulating well, almost healed. (After Dr. José Trueta Raspall, Barcelona, 1938.)

so applied that movements of foot and knee are allowed when possible. When perambulatory treatment of fracture of the leg is permitted, the patients are encouraged to walk with the help of stout sticks with a right-angled handle. Crutches are viewed with disfavour and not allowed.

We do *not* favour the immediate swathing of the limb in plaster-of-paris, because, excellent as is this method in securing fixation and satisfactory healing in many cases, while ensuring comfort to the patient during transport, the risk of undetected gas-gangrene and tetanus far outweighs its advantages. We therefore advise that no use of plaster bandages should be made for at least four days after excision, and not even then if any doubt exists about the possible occurrence of gas-gangrene. When this risk no longer exists, plaster bandages have much to recommend them and give good results (fig. 3), but as a general rule they should not be used except at a base hospital.

SPRAINS AND WOUNDS OF JOINTS

Sprains and sprain fractures are likely to be met with in large numbers, and all these cases should be passed directly to an orthopædic hospital for thorough investigation (including radiography) and adequate treatment. Such patients should never be allowed to return to their homes before being radiographed; otherwise troublesome litigation is likely in claims for compensation, and, unless radiograms are available, the medical men concerned are undoubtedly liable for negligence in treatment.

Wounds of joints are common and always associated with considerable damage to the ends of the bones whose articular surfaces form the joints concerned. These injuries must be regarded as extremely serious both because of the liability of the joint cavity to infection and because of the disabling arthritis which nearly always results from bone damage in the joint cavity. All such cases should be radiographed as a routine before going to the surgeon, so that the extent of bone damage and the presence of missiles in the joint cavity can be ascertained. The wound should be excised down to the articular synovial membrane, the edges of which must be trimmed, and the joint adequately washed out with sterile normal saline solution, after which every effort must be made to close the synovial membrane and, if it is feasible (as it is with perforating wounds), the soft tissues down to the joint. Drainage should be avoided if possible, and on no account must a drainage-tube be inserted into the joint cavity. Retained missiles and portions of clothing must be carefully sought for and removed from the joint cavity and its vicinity. The fractures must be dealt with on the lines already indicated, after which the limb must be fixed in an extension and splinted as described for compound fractures, and the patients evacuated as soon as possible to a suitable base hospital.

Suppurative arthritis.—Should infection have already occurred—and in some cases it occurs very rapidly—the wound should be excised down to the joint, the synovial edges cleaned, the joint irrigated as described, and a counter opening made to allow the joint to drain from its most dependent part, after which the limb is to be fixed in extension in a skeleton splint.

The *knee-joint*, from its position and the extent of its synovial membrane, is very liable to wounds

and infection, and, though we do not intend to deal with separate joints, wounds of this joint are so frequent that it deserves special mention. During the war 1914–18 we used to drain the knee-joint through an incision on the outer aspect of the limb in front of the biceps tendon and behind the ilio-tibial band of the fascia lata. Thus adequate drainage was secured through the most dependent part of the joint, and by the adoption of this incision a vast majority of limbs were conserved with a resultant joint which possessed 40–60 degrees of movement. In those cases in which there is great disorganisation of the muscles, severe comminution of bone, and exposure of joints prompt amputation is advisable, for the patient is thereby saved a long and painful convalescence with the preservation of a limb which is all too often painful and useless, and in many cases, though the patient is very fit when seen in the early stages, shock develops rapidly and is in most cases fatal unless the limb has been removed. This amputation should be performed above any tourniquet applied and without its removal.

THOMAS'S SPLINT DRILL

Thomas's splint was introduced in Liverpool in 1886 for the treatment of tuberculous knee-joints. In 1916 it was used for front-line treatment of gunshot wounds of the femur, and in 1917 the Thomas splint drill was first devised. By the use of this method the mortality was reduced from 70 per cent. to about 40 per cent. (in the field). The patients came into the casualty clearing stations fit and comfortable—even after a long journey. No other surgical measure ever gave such brilliant and satisfactory results. By permission of the War Office this drill is given as it appears in the latest edition (1935) of the R.A.M.C. Training Manual. A Thomas splint is applied in the first-aid treatment of the following conditions :

(1) All fractures of the femur, except when a large wound in the upper part of the thigh or buttock interferes with the fitting of the ring.
(2) All fractures about the knee-joint (including the patella) and the leg bones.
(3) Cases of extensive wounds of the fleshy part of the thigh or leg.

The Thomas splint consists of an oval ring, united obliquely to two lengths of iron which form the side bars and end of the splint; the ring is padded and covered with leather. The splint can be applied to either leg. It can be carried conveniently by threading the closed stretcher through the ring and tying the side bars to the stretcher. The bars should be kept lightly smeared with vaseline and the leather covering of the ring kept clean and soft by the occasional use of saddle-soap. For the application of the Thomas splint to a fractured femur three bearers are required : No. 1 being responsible for the application and Nos. 2 and 3 assisting him. The following apparatus is required :—

(1) Thomas's splint (as this splint is applied over the trousers in first-aid treatment, the ring must be large).
(2) Stretcher suspension bar.
(3) Reversible stirrup (Sinclair's).
(4) A metal skewer about 12 in. long or, if this is not available, a flannelette bandage 3 yd. long to form the clove hitch.
(5) Five flannelette bandage slings and five safety-pins.
(6) Five triangular bandages.
(7) Some loose woven bandages and wool.
(8) Two pieces of Gooch splinting (8 in. and 6 in.).

To form the slings five pieces of flannelette bandage approximately 30–36 in. long are folded into two. The loop ends are pinned over the inner bar of the splint, rolled up, and secured in position by short ties of loose woven bandage. The application may be practised on a person lying on a stretcher, which should rest on trestles, but an actual casualty should be splinted where he lies, unless it is absolutely necessary to remove him to a place of shelter. The bearers should practise the application of the Thomas splint in the dark and wearing anti-gas respirators.

1. *Preparation of stretcher.*—The ordinary army blanket is about three times the width of a stretcher ; advantage is taken of this to increase the covering of the patient by folding the blankets in the following way. The two blankets to be placed under the patient are folded lengthwise in three folds ; two folds of each blanket are placed on the stretcher, thus making four layers of blanket under him ; the third fold of each blanket is left hanging over the side of the stretcher. The third blanket is folded lengthwise in two and placed over the patient.

2. *Extension.*—No. 2 bearer stands at the foot of the stretcher facing the patient and opposite the injured limb. Grasping the heel of the boot with his right hand and the toe with his left, keeping the arms straight, he exerts a steady pull, thereby producing the necessary extension. No. 3 supports the limb at the site of the fracture until the dressing and Gooch splinting have been applied.

3. *Maintaining extension.*—To maintain extension a pointed metal pin or skewer about 12 in. long is passed obliquely through the boot just in front of the heel and close to the sole, so that it lies between the sole of the foot and that of the boot. The outer end will then be about 1½ in. nearer the toes than the inner end, so that, when the extension pin rests on the side bars of the splint, the limb and foot are in external rotation. A piece of bandage or tape is attached to each end of the pin and tied off to the splint as described under 5, Fixation of the leg.

Another method of maintaining extension is by means of the *clove-hitch halter.* To form the clove hitch, No. 1 bearer takes a 9 ft. length of flannelette bandage and holds it in the left hand, back uppermost, by its middle point, thus forming a right and left half. With the right hand, back towards himself, thumb pointing down, he grasps the middle of the left half, raises the right hand to the level of the left hand to the right of it, thumb touching thumb, thus forming two loops, right and left. He now carries the right hand, without any further turning, to the back of the left, thus forming a clove hitch with a diameter of 10 in. This is applied over the foot without relaxing extension, both ends on the outer side ; the long end is carried under the instep, up, and through the loop round the ankle. This forms the halter, which should fit without being tight. The two extension bands thus produced are ready to be attached to the splint later on.

4. *Slipping on the splint.*—No. 1 bearer slips on the splint, No. 2 removing and reapplying the upper and lower bands alternately to allow the ring to be passed over the foot. The splint should be pushed up under the buttock as far as possible, care being taken to keep the transverse bar horizontal. No. 3, as before, steadies the limb.

5. *Fixation of the leg.*—The extension bands of the skewer or clove hitch are tied round the notched bar at the end of the splint as follows. The outer band is passed over and under the bar at the notch, drawn taut, and held over to the opposite side. The inner band is passed in the reverse direction—

i.e., under and over the notched bar, crossing the first band at the notch and preventing it from slipping. The two bands are finally tied off by a half-bow. As soon as the extension bands are tied, No. 2 bearer ceases to hold the foot and supports the lower end of the splint. Next, the middle sling is tied off over the outer bar behind the knee, No. 3 keeping the knee slightly bent. The slings behind the ankle and calf are tied off, so that the leg is now supported in a shallow trough, with the long bars of the splint level with the centre of the leg. To prevent the leg from rising off the splint, a narrow-fold bandage is placed across the leg just below the knee; the ends are carried down between the leg and the splint, crossed behind, brought up outside the bars, and tied off on the front of the leg. The lower limb is thus fixed in a position of extension, and it may be moved freely without causing pain to the patient or damage to the injured part.

6. *Dressing the wound.*—The wound is exposed by cutting away the overlying portion of clothing, and the dressing is applied. If there is severe hæmorrhage, steps will be taken to control it before Gooch splinting is begun.

7. *Gooch splinting and bandages.*—One piece of Gooch splinting is placed behind the limb and secured by tying off the remaining two slings. The other piece is placed in front of the limb, care being taken to prevent the lower edge from pressing on the knee-cap. The dressing and splints are now kept firmly in position by two narrow-fold bandages in the following manner. The centre of each bandage is placed on the front of and over the centre of the Gooch splinting. The ends are taken down between the limb and the side bars of the splint, crossed behind, and then brought up on the outside of the bars and tied off in front of the limb.

8. *Stirrup and figure-of-eight.*—The stirrup is sprung on to the splint so that the shaped part fits the sole of the boot, thus preventing lateral movement of the foot. A narrow-fold bandage is applied in the following manner to form a figure-of-eight. The centre of the bandage is placed under the sole of the boot. The ends are brought forward, crossed, taken down behind the ankle, crossed again, brought up outside the bars, and tied off in front of the limb.

9. *Spanish windlass.*—The extension bands are retied, if necessary, and a small piece of wood is inserted to twist up the bands as required (fig. 2).

10. *Pad in the ring.*—A pad is placed inside the ring on the outer side of the thigh to act as a wedge and prevent undue movement.

11. *Suspension bar.*—The suspension bar is now fitted to the stretcher, grips away from the runners, with its horizontal part one hand's breadth in front of the foot. The splint is then slung by two long ties, a hand's breadth below the horizontal bar. To prevent lateral movement, the ends of these ties are secured round the uprights of the suspension bar. To prevent vertical movements of the splint, a narrow-fold bandage is passed round the outer bar of the splint below the foot and tied off to the runner of the stretcher.

12. *Warmth.*—The blankets are adjusted so as to give four thicknesses over the patient, who is then ready for removal. For work in the dark, in pinning the blankets, it is advisable to include a small piece of bandage or other white material under each pin.

GRAINS AND SCRUPLES

Under this heading appear week by week the unfettered thoughts of doctors in various occupations. Each contributor is responsible for the section for a month; his name can be seen later in the half-yearly index

FROM AUTOLYCUS

III—SPEECHES AND ADDRESSES

It needs some of the egotism I deprecated earlier to venture upon an essay on after-dinner speaking, but we need also someone ready to risk obloquy in a good and humane cause. There is a popular delusion in this country—where it is more of a delusion than elsewhere—that anyone can get to his feet and hope to charm and entertain his fellow men with no other equipment than a few anecdotes and his own natural eloquence. There never was a greater error, so let us begin with the aphorism that the speech that wasn't worth preparing isn't worth listening to. Least of all men would the practised political speaker or the barrister venture unprepared upon an after-dinner speech, and how should the amateur hope to succeed where these experts know they cannot do so. In a recent speech Lord Baldwin spoke feelingly of the exacting nature of public speaking, more particularly for those who were most successful. It may be taken as a general rule, therefore, that all good after-dinner speakers prepare their speeches, though a few from a false pride affect unconvincingly not to do so.

The good after-dinner speech is undoubtedly a work of dramatic art, calling for good lines and better delivery. Now most of us have no natural eloquence and cannot construct or utter an unrehearsed sentence of any length without running up some verbal cul-de-sac and having to retrace our steps for a fresh start. In this halting process each hesitation is marked by a maddening "um" or "eh," and the general effect is that of a man thinking aloud in the erect position. But, as I have said, the good after-dinner speaker is an actor and should know his lines. Then as to matter, I venture to risk contradiction when I say that the best speakers do not use anecdotes, or but sparingly and then adequately led up to and relevant to the general theme that an after-dinner speech should have. A few odds and ends of rehashed anecdotes strung together by some slovenly English do not make a speech, though too often they do duty for one. Probably the best speech is wholly the product of the speaker's own fancy, rich in analogies and in figures of speech, not pompous but light, humorous and easily grasped in passing by the listener. The whole should be couched in good rhythmic English, and with a proper feeling for the choice of words which this requires.

In Fowler's "Modern English Usage," a most excellent bedside book, this matter of rhythm in prose is excellently discussed and illustrated by a magnificent example of rhythm from the Old Testament. Excessive quotations are as pretentious in speeches as they are in essays and formal addresses and should be avoided. The occasional speaker, in short, might do worse than write out his speech and learn by reading it aloud whether or not his sentences are easy of utterance and harmonious in sound. This may sound very difficult, but to become even for ten minutes a public entertainer is necessarily a task

calling for thought, and the sense of artistic satisfaction that a man may get from the successful delivery of a good speech is reward enough.

* * *

Let us turn now to another side of medical eloquence that from time to time may have an unexpectedly light side, an astringent humour of its own. I refer to the addresses to medical societies up and down the country that are given by visiting speakers during the winter months. I have had an odd experience with these that one more worldly-wise would perish rather than relate, but my readers know ere this that they move with me in other realms than those of reason. I recall the first occasion on which I was invited to give one of these addresses. The invitation came from the ancient medical society of a Cathedral City, and the notion that I had been heard of in circles so exalted was almost incredible. I determined to give an address that should be spoken of with reminiscent awe by all who heard it, for years yet to come. The day arrived and the shades of a damp November evening were drawing on as I reached my host's house. The meeting was to be held in the board room of the local hospital, and primed by an excellent dinner we set out for it. As we drove along my host observed casually that an epidemic of influenza was devastating the town and might prevent that overflowing audience that in other circumstances I could have expected. Reaching the hospital, we passed along the usual dimly lit passages to the board room. An impressive assembly of chairs greeted me. The officers of the society welcomed me warmly and hastened to deplore that devastating epidemic of influenza that might keep away so many of their colleagues. While we exchanged small talk on this subject, the two resident medical officers arrived. In a few seconds two lady doctors followed, and quite a little crowd of seven of us were gathered. Someone had the notion of turning on some more lights and the place began to look quite gay, though the paralysing fixity of about fifty empty chairs was beginning to daunt me. Time passed, half a dozen more men straggled in one by one and stood about exchanging compliments. It was by now ten minutes after the time advertised for my address, and the president suggested that he should take the chair. We spread ourselves out, I sitting behind a little tribune, clutching my typescript in damp hands and finding my tongue strangely dry. The secretary read the minutes of the last meeting into the echoing space, and told how an address had been given by Sir Willoughby Patterne on the hormone treatment (or was it the vitamin treatment?) of something or other in women (or was it in men?). An animated discussion had followed, a vote of thanks had been enthusiastically passed, and 79 members had been present (Ah! thought I in my innocence, that must have been before the influenza epidemic began to devastate the town). I was still cogitating upon this when I heard the president introducing me to the luckless thirteen whom my fame had been sufficient to drag from their homes this nasty evening. It appeared that I was a very eminent person, was an ornament on the staff of my hospital, had done them a great honour in coming to address them, and he now called upon me to give my address. I stood up, cleared my throat yet again, faced the array of Windsor chairs and the scattered stalwarts in whom nothing could kill the thirst for knowledge, and began. When I had finished, my audience was very kind to me. Coffee and sandwiches appeared and we all gathered together round the table at the end of the vast room, like refugees clinging together for warmth and mutual support. So ended my first introduction to public life.

The following winter two similar invitations arrived. Better luck next time, I thought, and again with the earnestness of comparative youth I composed an address for each of them. On my second excursion my host met me at the railway station. It was again a drab winter evening, and as he shook hands he told me he had feared he might not have arrived in time to meet me as an influenza epidemic was devastating the town and had kept him on the run all day. My heart sank, and I remembered that history repeats itself. It does, but this time there were two more hospital residents to round up for the meeting, and also two old friends whom I had known during the war in the R.A.M.C. When it came to the point, there were no less than seventeen of us. Once more the secretary read the minutes, and it appeared that that infernal fellow Sir Willoughby Patterne had been before me again. This time his score had been only 54, so I felt that I was catching up. The chairs no longer intimidated me quite so fiercely, and as I spoke sitting I could not see their serried ranks quite so well. The place looked almost half full. After I had finished I heard more of the influenza epidemic.

By this time I began to wonder whether it was altogether fair to this popular malady to blame it for the poor houses I seemed to be securing. There might be other reasons obscurely connected with my humble rank and professional standing. Therefore before I started off for my third excursion I wrote to the local secretary, who was an old fellow-student, and asked him if by any chance influenza was devastating his town and if so whether it might not be wise for me to postpone my visit. He assured me by return that all was well and that I might expect a first rate turn-out of the local doctors. So I set out from Paddington for the west, again on a winter afternoon. As we passed Swindon I noticed the air was getting misty, and a dense fog greeted me as I stepped from the train at my destination. However, I was cheered immensely as my portly friend bore down on me through the damp and chilling haze. We had a twelve-mile drive before us, the fog getting thicker as we left the town and reached the open country. "I'm afraid this fog will rather dish our meeting," he remarked, and my forebodings could no longer be stayed. To cut a long story short, my score that evening was seven, but they were a warm-hearted seven and after the meeting we foregathered at my friend's house and extended a cheery evening far into the night.

* * *

As I was leaving next morning I said to my friend "Has that man Willoughby Patterne ever been down here to talk to you fellows?" "Oh Heavens!" he replied, "that was a wash-out. We had influenza here at the time, and only five men turned up to listen to him. He was sick about it." I could have flung my arms about him and wept with joy. My self-respect was restored. But still, it must be a great thing to have a handle to your name when you go on tour.

MEMORIAL TO SIR FREDERICK MOTT.—A memorial plaque to Sir Frederick Mott, who died in 1926, was unveiled at the laboratories of the medical school at Birmingham Centre Hospital on Feb. 9. The plaque is the gift of Dr. H. A. Pullar Strecker who was associated with Sir Frederick in the work of the Joint Board for Research in Mental Disease for Birmingham and adjacent counties.

LETTERS TO THE EDITOR

PROTECTION OF CHILDREN IN TIME OF WAR

SIR,—The question of the protection of children in war-time through methods of billeting, evacuation, camps, and such like, is naturally one of much concern to a society like the Save the Children Fund. And it is important to realise what efforts have been and are being made to deal with the problem from an international point of view. For a long time the British Fund and the Save the Children International Union have been discussing it, and at the annual council of the latter at Geneva in April last proposals were put forward and approved in principle by the various national societies there represented, including the British, Dutch, German, Greek, Swedish, and Swiss. But it was agreed that governments would have to be consulted before any definite action could be taken.

The question again came before the International Red Cross Conference which was held in London last June, and a resolution was passed asking the International Red Cross Committee "to study the problem of protecting women and children against the suffering resulting from armed conflict, in co-operation with the Save the Children International Union, and recommending the National Red Cross Societies to bring the question before their Governments after consultation with the national bodies specially concerned with the protection of women and children." In pursuance of this resolution, there was formed a joint commission of the International Red Cross Committee and the Save the Children International Union. This commission, assisted by legal experts, has now completed its revision of the draft convention prepared by the union, which applies to children only and which it is hoped some neutral country will be prepared to submit to an international conference for final approval and subsequent ratification on the model of the international red-cross convention. The convention, which is entitled "convention for the protection of children in the event of armed conflict," applies to all children under 15 years of age "irrespective of race, nationality, or creed, residing at the outbreak or during the period of hostilities in the territories of states engaged in armed conflict." Belligerents shall allow food, clothing, and other supplies to be sent from other countries for the benefit of such children (Art. 2). In time of peace, or after the outbreak of hostilities, places of safety shall be established under certain conditions for the exclusive purpose of the protection of the children to be concentrated therein, and these places shall at all times and in all circumstances be respected and protected. Such protection shall include the persons who may be engaged in the care, education, and maintenance of the children, but in no case shall they exceed in number 10 per cent. of the children placed under their charge (Arts. 3–8). A distinctive sign or emblem shall be displayed over all such "places of safety" and also worn by the persons above referred to (Arts. 9–11). A list of such places of safety shall be duly notified in time of peace and shall be under the supervision and control of a commission of neutrals who shall immediately inquire into cases of alleged violation of the convention (Arts. 12–14). Provisions are made for the adherence of belligerents to the convention (Arts. 15–18), and for the prevention of abuses and violation (Arts. 19–21).

I think it will be generally admitted that such a convention if observed—and its infringement would involve more universal condemnation even than a breach of the red-cross convention—should do something to mitigate the dangers and the horrors of war and preserve the rising generation for a future to which, it is hoped, such abominations will be unknown. No civilised government surely can hesitate to subscribe to it or to any form which it may take after exhaustive examination and discussion. And it would serve greatly to fortify the operation of such national schemes as are now under debate, particularly as regards the marking of children's camps with the proposed international symbol and the penalties of infringement.

Is it too much to hope that the seed thus sown will before long bear fruit and the conscience of the world be aroused to the imperative necessity of doing by joint action at least as much for the safety of its children in war-time as it does in peace?

I am, Sir, yours faithfully,

H. D. WATSON,
Chairman.

The Save the Children Fund, 20, Gordon Square, London, W.C.1, Feb. 9.

TORSION OF THE APPENDIX OF THE TESTIS

SIR,—It is often surprising to find that some condition which is now relatively common was first mentioned in medical literature as recently as 1922. Such a condition is torsion of the appendix of the testis which is fully and carefully described by Mr. G. D. F. McFadden in your issue of Feb. 11. Can it be that it is only of late years that this little structure has misbehaved itself—perhaps it is the hectic whirl of modern life that has caused it to twist? Or can it be that it occurred in days gone by, but passed unrecognised? This is unthinkable, because it is surely admitted by all that clinical observation was far more acute and exact then than it is now, when so much diagnosis is, alas! made on reports from the pathological laboratory; but Mr. McFadden tells us of no pathological test for diagnosing torsion of the testicular appendix.

The purpose of this letter is to record briefly a case of torsion of the appendix of the testicle upon which I operated in 1929 where the signs were somewhat different from those described by Mr. McFadden.

The patient was an adult who had extremely severe pain in his right testicle, and on examination there was localised tenderness at the upper pole of the testis, so severe that operation was carried out immediately. I was not aware of the condition at that time and an accurate diagnosis was not made until the testicle was exposed at operation and the appendix seen to be about one-third of an inch long, dark purple in colour and twisted on its pedicle. It was removed.

The three points in which this case differs from those reported by Mr. McFadden are that this case was in an adult, there was no swelling and œdema of the scrotum, and it was easy to elicit well-localised tenderness at the upper pole of the testicle.

How delighted would Morgagni have been could he have realised that not only was his little hydatid on the tip of the tongue of every medical student studying anatomy, but that through its gyrations it had stepped into clinical and operative surgery.

I am, Sir, yours faithfully,

London, W.1, Feb. 13. JOHN HOSFORD.

AS OTHERS SEE US

SIR,—The leading article in your issue of Feb. 4 seems to me to reflect the views of those whose position is financially secure. I have often noticed that the highest moral principles—by which expression I mean the high ideals and exalted altruism we are prone to expect in the conduct of others—are usually on the lips of those who enjoy an assured income. I feel that it ill behoves such people to advise or blame in the matter of the admission of refugees to medical practice. Most medical men work in circumstances that are, gloss them as we will, competitive, and it is for this majority to decide this question because it is they who would be most affected by the advent of refugees. The conduct of this majority towards the refugees may be mean and careless of the public weal, but it is not for those who risk nothing to point the finger of scorn.

Is this conduct, however, so despicable as you imply? You say "the main appeal" (that is the appeal for exclusion) "has been to the pocket and to prejudice." Of course it has, and why not? Was it not Lucretius who said "happy is the man who can afford to take no thought for his pocket"? I have found that medical men are for the most part kindly, generous, and long-suffering; but they are not, naturally, entirely uninterested in fees. Is it not time that we dropped the pleasant fiction that doctors practise their profession solely in the interests of science and humanity? This "tradition that has hitherto made medicine pleasanter than many other occupations," as you put it, is nowadays plain humbug, and deceives no-one but ourselves. It originated in days when many practitioners were, like Dr. Thorne, gentlemen with some independent means, and is no longer suitable today when many have to borrow the money to start in practice, and when the middle classes, in comparison with those of a generation ago, are greatly impoverished. Nowadays very few men in any profession are earning sufficient to educate their children and provide for their old age; many are dependent for these things upon money made by their relatives in the piping times of Queen Victoria. Furthermore this impoverishment of the middle classes is rapidly destroying private practice.

It is true, as you say, that there are many places in England and elsewhere where doctors are too few. In fact, almost every doctor in private practice is overworked, but he is certainly not overpaid. In these circumstances I cannot see that concern for the pocket is so despicable. "Can we," you ask, "confidently claim that the interests of the medical profession, regarded as money-earners, never conflict with those of the community?" Why should we make such a silly claim, seeing that the interests of the individual are always to some extent in conflict with those of the community?

You praise, quite rightly, the generosity of those university teachers who have sacrificed a portion of their incomes to help support refugee scholars. You apparently expect the medical profession to imitate this example, but the analogy is false because the conditions are not the same in each case. An influx of refugees into "competitive" practice might easily reduce the incomes of neighbouring English practitioners very considerably. The extent of this reduction is obviously unknown until trial has been made, and if the trial proved more damaging than expected the harm could not easily be remedied.

Maybe the fears of the profession are groundless; they are certainly aggravated by this element of the unknown, but they are not altogether unreasonable and are certainly quite as human as the humanity the profession is expected to serve. Moreover, it must not be forgotten that to the public, which still associates medicine with magic, the possession merely of a foreign name has thaumaturgical qualities of great magnitude. It is only a few weeks ago that a woman, who is regarded by those who know her as intelligent, said to me "one still has to go to the Continent for the best surgery, I suppose."

There is only one way in which the medical profession can become more altruistic than it is at present; it must imitate the wisdom of the Roman Church and ordain that its priests be celibate and preferably live together in monastic communities so as to be freed from the cares of a family and the world.

It should be possible to find a way to secure the services of refugees without jeopardising the inadequate incomes of overworked men. Our academic idealists might well employ their leisure in devising such a scheme. Until they do, it is unreasonable to expect things to be other than they are. In conclusion I may add that no interest of mine would be in the least affected by the admission of refugees.

I am, Sir, yours faithfully,

G. H. CRISP.

Elm Park Road, Chelsea, S.W.3, Feb. 13.

PROPHYLAXIS OF TUBERCULOUS EMPYEMA

SIR,—In my article appearing on Jan. 21 I said that a spontaneous pneumothorax which is accompanied by pleural effusion should be regarded as tuberculous. I was interested to read the letter from Dr. M. H. Pappworth in your issue of Feb. 11 in which he points out that fluid may appear in the pleural cavity when any pneumothorax is resolving on account of the partial vacuum which is present.

I entirely agree with Dr. Pappworth on this point, but I do not think there is any difference between us: it is simply a question of defining one's terms. When a benign, non-tuberculous spontaneous pneumothorax is resolving, a little fluid often appears in the pleural space and usually takes the form of a thin film of fluid over the almost expanded lower lobe. This thin film of fluid cannot be dignified by the name of "pleural effusion." I think that "œdema ex vacuo" is a better term, and it seems that Dr. Pappworth is of the same mind for this is exactly the phrase which he uses in his letter.

There has, of course, been much argument in the past as to the relative frequency of emphysema and tuberculosis as causes of spontaneous pneumothorax. I think I am right in saying that the presently accepted view is as follows: tuberculosis is the commonest cause if all cases of spontaneous pneumothorax are grouped together, regardless of the previous health of the patient; of cases of sudden spontaneous pneumothorax occurring in apparently healthy people, about 90 per cent. are due to rupture of an emphysematous bulla. I should, however, welcome the views of others on these points.

I am, Sir, yours faithfully,

LAWRENCE ROBERTS.

Papworth Hall, Cambridge, Feb. 11.

STIGMA AND PREJUDICE

SIR,—Referring to the tendency and natural desire to employ euphemistic names for mental cases, hospitals and clinics, I should like to mention that as long ago as 1845 it was suggested (I believe by Dr. Thurnam) that the County Pauper Lunatic Asylum should be called the Orthophrenic Institution.

I am, Sir, yours faithfully,

JAMES R. WHITWELL.

Chandos Street, Cavendish Square, W.1, Feb. 9.

THE FEET OF THE INDUSTRIAL WORKER

SIR,—I have followed with interest the articles appearing on this subject and ask myself why the feet of the industrial worker should come so prominently under review. Why not the hands which are comparable appendages? And why only refer to the industrial worker? People in all walks of life complain of their feet, the leisured as well as the workers, men as well as women, wearers of high heels and wearers of low heels. Nor is the problem solved for the worker when she leaves her work to go home, so it cannot be the work that is to blame. One point is common to all the sufferers—they are glad to sit down and get their shoes off. It is not simply a question of taking the weight off the feet by sitting down; they want to get their shoes off because they are uncomfortable.

We may therefore assume that in at least 99 per cent. of foot discomfort the shoes are to blame, and according to lay reports the leather research workers are taking the matter in hand. One recent article implies that heels of different height may be necessary in different occupations, and the height of heel for the woman on duty should be different from that off duty. It is not likely that such line of research will lead anywhere. Men wear the same height of heels on and off duty, and if their shoes are comfortable they can wear them all day—at work and away from work. The rich woman with foot discomfort has dozens of pairs of shoes for wear on different occasions, but usually she has at least one pair which are more comfortable, although in appearance and height of heel they may not appear much different from the uncomfortable ones. My contention is that with a reasonable heel—and I do not rule out those 1½ in. or 2 in. high—the height is almost negligible, provided other conditions are satisfactory. What matters is the insole and build of the shoe. I have proved to myself in hundreds of cases that it is possible to alter and adjust shoes not only to make them more comfortable but to produce far-reaching effects on the wearer, without altering the height of her heels.

At different times I have hinted at some of the defects seen during the process of stripping and examining some thousands of pairs of shoes, but to remedy those defects is too big a task for any one firm of manufacturers. Nor should one firm be in a position to make profit out of this which is a national affair and ought to be supervised by the government. Whole sections of workers, tramwaymen, policemen or soldiers, or girls in different trades, say telephone operators or post-office workers, could be shod in accordance with various instructions and the effects noted. The expense of such investigation need not be very great, because the people who are the subject of the investigation must wear shoes in any case, and the cost in the end would not work out greater than the cost of shoddy or unsuitable shoes.

If we grant that shoes cause foot trouble, we must see that the children are properly shod, but in the poorer districts this is not at present possible. It presents a hard and disturbing problem to medical officers of health who are attempting to deal with the need. Some of these children never have new shoes of their own. They get the cast-off shoes of someone else, perhaps bought in a jumble sale for a penny, and when they are worn out they have no money to pay for repairs. They simply wait till there is another jumble sale. How can children's feet properly develop and function under such conditions? It is another national problem.

Not least in attacking the question I would seek the help and coöperation of the orthopædic surgeons. I would first of all ask them to realise that in the foot they are not dealing with a piece of dead mechanism but with a living thing which reacts in extraordinary ways to different stimuli. And these stimuli can be applied in such a way as to make the foot strong, whereas applied in other ways the foot may be weakened and crippled. A bridge which shows signs of weakening may be propped up and supported so that it does not fall; but a weakened foot still has within itself power of repair and adaptability, and props applied as in a weak bridge may simply destroy the inherent power of repair in the foot. I have tried most of the mechanical aids myself, and have been surprised how uncomfortable and crippling they are, even though on casual examination they look as if they might be comfortable and useful. Because they have been advised by some orthopædist, no matter how eminent, does not necessarily mean that they are the last word in shoe adjustment and incapable of improvement. If only orthopædic surgeons would taste a little of their own medicine; let them first of all alter their own shoes and wear them for three or four days, or even three or four hours, then they would begin to wonder whether such alterations were likely to produce any beneficial results. They would look at things from a different angle, and we would soon see the end of most of those metatarsal pads and bars, bunion pads, and the crooked heels and wedges generally recommended.

I am, Sir, yours faithfully,

Portland Place, W.1, Feb. 13. THOMAS MARLIN.

EXCRETION OF INJECTED ANEURIN

SIR,—Prof. Marrack and Miss Höllering, in their discussion on the excretion of vitamin B_1 in your last issue, suggest that the estimation of vitamin B_1 in urine by the thiochrome method will give results which are not likely to be more than 30 per cent. too low.

When the method of Westenbrink and Goudsmit, employing a fluorimeter, is used it seems to me that the results cannot be established within a range of less than about 500 per cent. The difficulty arises from the fact that even diluted urine prevents in some manner the full fluorescence being developed from crystalline aneurin added to it. This inhibiting effect is exerted by different urines in differing degrees. While in some cases added vitamin B_1 gives a fluorescence equal to 50–80 per cent. of its theoretical intensity, in other cases only as little as 20 per cent. will be produced. The estimation of the vitamin B_1 in the urine depends on the measurement, by one means or another, of the fluorescence induced in it by controlled oxidation. The results, however, can be calculated in two ways. They can either be measured on the basis of the fluorescence induced in the particular sample of urine by a measured amount of added aneurin as has been done by Prof. Marrack, or they can be calculated from first principles from the known fluorescence of thiochrome. It can be seen that the former calculation may give results five times as large as the latter. While the nature of the inhibition of the fluorescence of thiochrome by urine is so little understood it would be wise to treat the figures obtained by the thiochrome reaction with some reserve.

I am, Sir, yours faithfully,

MAGNUS PYKE.

The Research Laboratories, Vitamins Ltd., Upper Mall, Hammersmith, W.6, Feb. 11.

CLINICAL USE OF STILBŒSTROL

SIR,—I have read with interest the letter from Dr. Varangot on the toxic effects of stilbœstrol and Dr. Bishop's reply to it. I was among those invited by the Therapeutic Trials Committee of the Medical Research Council to test the œstrogenic effect of stilbœstrol, and my results were published jointly with those of Dr. T. N. MacGregor (*Brit. med. J.* Jan. 7, p. 10) and they closely resembled those of Dr. Bishop.

I have had personal experience of 48 cases treated with stilbœstrol. Three patients complained of a certain amount of nausea but no vomiting or epigastric pain. In two of these the nausea later passed off, although treatment was continued. In the third the nausea was more severe and there was epigastric pain, but no vomiting. In this case treatment was discontinued. Three other patients admitted on questioning to a certain amount of nausea, but had not considered it sufficiently severe to mention. All the menopausal cases except the one in which treatment had to be abandoned were enthusiastic about the relief they obtained from their symptoms.

Dr. Varangot appears to have ignored the fact that stilbœstrol is more active by mouth than the naturally occurring œstrogens. He points out that in menopausal cases treatment must be prolonged. That being the case it is a great advantage to the patient and a convenience to the practitioner to be able to avoid irksome injections. If, as Dr. Varangot states, stilbœstrol by mouth is three times less active than œstradiol benzoate by injection, it is a simple matter to treble the dose of stilbœstrol.

I am, Sir, yours faithfully,

Harley Street, W.1, Feb. 13. W. R. WINTERTON.

SEPTICÆMIA OR BACTERÆMIA?

SIR,—In a leading article in your last issue on the treatment of acute osteomyelitis the following statement is made: "Children over the age of two years are certainly suffering from a septicæmia which is staphylococcal in origin . . ." The term septicæmia I was taught to apply to a grave condition in which bacteria not only enter the blood-stream but multiply there. This restricted use of the term is, I understand, approved by the bacteriologists of today. It implies a marked lack of resistance to the particular strain of bacteria concerned. Unfortunately the word is constantly being used when no true septicæmia is present. In many types of infection, both medical and surgical, bacteria may be found in the blood provided the culture be taken at the right moment; yet the bacteria are not multiplying in the blood and the patients are not suffering from septicæmia. Bacteræmia is a convenient term for this temporary, recurrent, or intermittent pollution of the blood-stream. Examination of the current textbooks of surgery reveals that most of them are far from clear on this point, and some are positively inaccurate and misleading.

As to acute osteomyelitis, all agree it is the result of a blood-borne infection; the responsible bacteria on entering the blood-stream are for the most part destroyed, only a few finding a suitable lodging in one or more bones. Each such focus forms a possible source of further temporary and recurrent infection of the blood-stream. This constitutes one reason for surgical interference of the infected bone—conservative interference let it be by all means. In the majority the resisting powers of the patient are sufficient to prevent the bacteria from multiplying in the blood, and septicæmia does not occur. There are however cases in which true septicæmia is present from the start, the local osteomyelitis being no more than a complication, the efficient treatment of which makes no difference whatsoever to the grave general condition of the patient. I submit that in many of the more severe cases of osteomyelitis septicæmia can only be excluded by draining the focus in the bone and watching the effect on the temperature.

However, it is not my purpose to discuss the treatment of acute osteomyelitis, but to protest against the use of the word septicæmia for every condition in which living bacteria are found in the blood.

I am, Sir, yours faithfully,

Harley Street, W.1, Feb. 14. H. A. T. FAIRBANK.

"MOTHERS' WELFARE CENTRES"

SIR,—May I endorse what Dr. Joan Malleson had to say in your last issue on the problem of criminal abortion in this country. It is certainly true that the really necessitous woman has not the same opportunity of having her case fairly investigated and treated as has her better-to-do sister, with the result that she is, all too often, driven to the appalling alternative of terminating a pregnancy criminally. Dr. Malleson's suggestion for the establishment of clinics where such women could obtain early examination, advice, and help would be one step towards the solution of the criminal-abortion problem.

We have tried in a small way to meet this need at some of the women's welfare clinics in Devon. Through the kindness of the pathologist to a general hospital in the county we are able to get Aschheim-Zondek tests done free for necessitous patients, and the consulting staff of the same hospital is always willing to admit and deal with cases which, on investigation, prove to be bad maternity risks. Practitioners are beginning to take advantage of this service and the women themselves know that if they are ill or have had serious complications with previous pregnancies or confinements their case will be sympathetically considered. Such a service does not of course obviate the need for making available sound contraceptive advice as the first line of defence for these women.

I am, Sir, yours faithfully,

MARGARET HADLEY JACKSON.

Crediton, Devon, Feb. 14.

THE NATURE OF VIRUSES

SIR,—My attention has been drawn to the fact that a theory regarding the possible nature of viruses which I put forward towards the close of the Rede lecture for 1938, on Virus Diseases and Viruses, is not original. I had overlooked an article in *Science* (1935, **82**, 443) in which Dr. R. G. Green, of the University of Minnesota, had already enunciated essentially similar views, pointing out that viruses might be regarded as micro-organisms which, through parasitism, had lost some structures and substances. To quote Dr. Green's words, "Such a virus would be a functionally complete unit of life only when immersed in living protoplasm. There it would complement its own limited vital processes with those of the surrounding protoplasm."

I much regret that Dr. Green's communication escaped my notice, with the result that I omitted to give credit to him for a prior publication of this conception.

I am, Sir, yours faithfully,

P. P. LAIDLAW.

National Institute for Medical Research, Hampstead, N.W.3, Feb. 9.

PARLIAMENTARY INTELLIGENCE

BLOOD-TESTS IN BASTARDY CASES

IN the House of Lords on Feb. 8 the Bastardy (Blood Tests) Bill was referred to a Select Committee. In moving the second reading Lord MERTHYR said that in the years 1926–35 the average number of applications in bastardy cases was 7200 a year. This bill was designed to bring science and medical knowledge to the help of the law in this matter. Human blood could now be divided into distinct groups which were hereditary, and their transmission was governed by a Mendelian law which seemed quite immutable. These groups were present from before birth till after death. In a very small number of cases the group might not be apparent in a child until it was some months old, yet it was always apparent sooner or later, and therefore the worst difficulty that could arise would be that the test would have to be postponed for a short time. The groups never changed, so that if the blood-group of a mother of a child was known, and also that of the child itself, a table could be drawn up showing to what groups the blood of the father must belong. If a man was accused of being the father of a child and his blood-group was not in that table, then he could not be the father of that child. By this means, while it could never be proved that a man was the father of a child, it could be shown in a certain number of cases that he could not be the father. In 10–15 per cent. of all the contested affiliation cases in the courts the father could be definitely excluded in this way. Results obtained all over the world revealed that out of every three accused men, who were in fact innocent of being fathers, one could be exonerated by this method. The system was used extensively on the Continent, particularly in Germany and Scandinavia, and it was legal in at least two of the American states. In clause 1 of the bill the important words were used that "the Court may, and at the request of either party shall," order a test to be made of the blood of all three of the parties to the case—the mother, the child and the alleged father. If compulsion was not used the practice would vary widely all over the country. The courts at present had no power to order tests and they were only carried out by consent. As a result of this clause tests would be ordered wherever there was a real conflict of evidence in paternity cases. Clause 3 enabled a certificate of a pathologist —i.e., the actual tester—to be accepted as evidence in a court of law. Clause 6 provided that the tests should be made by approved persons in the shape of registered medical practitioners. Summing-up, Lord Merthyr said that without this bill these blood-tests would go on in small numbers, but they would be expensive, and confined to cases where there was agreement. The tests would be completely unregulated; there would be no standardisation of practice, and no rules.

Lord GORELL, speaking as president of the National Council for the Unmarried Mother and her Child, said that the time was not yet ripe for the bill. The possibility of mistakes seemed a decisive argument against it. He understood that few people in this country were really qualified to conduct the tests. It was a drastic proposal that a certificate given by an approved person, who need not come before the court, should be treated as the sole evidence.

Viscount DAWSON OF PENN said there was hardly any subject in medicine which had been so thoroughly studied as this. In the study of the types of blood there had emerged two qualities, A and B, that gave four groups—namely, blood which had the quality A, blood which had the quality B, blood which had the combined qualities A and B, and blood which did not possess these qualities at all. The groups were for convenience labelled A, B, AB and O. Neither quality A nor quality B could appear in any child unless that quality was present in one or both of the parents. To that proposition there was no exception whatever. Secondly, if one took children and parents the combinations of AB parent with O children, or vice versa of O parent and AB children were impossible. It was on these propositions that this work depended. Those two propositions rested on tests made by fifty independent observers spread over the civilised world on a total of 8717 families with 19,089 children. Among this large group there were 30–40 discrepancies which would be found to be due either to faulty technique or to illegitimacy. In a more recent study on 10,092 mothers and 12,943 children no single exception was found. Under the Mendelian law they could compute mathematically what were the probabilities in certain groups of observations. A theoretical computation was made of the frequency with which a quality which appeared in the parents reappeared in the child. In the group he had just mentioned the computed result was very nearly identical with the actual observations. Seldom were facts better attested than this. At a later period two other qualities, M and N, were discovered in the red blood-cells, and these could be used in skilled hands for confirmation. The test was of limited application: it could only prove non-paternity and only to the extent of 30 per cent. of the innocent men. He protested against the suggestion that there were not enough people able to carry out the tests. There was not a teaching centre or a hospital of the first importance where there was not a pathologist perfectly well able to perform them.

THE GOVERNMENT VIEW

The Lord Chancellor (Lord MAUGHAM) said that the Government's view was that the bill should go to a select committee. They would therefore not attempt to prevent the second reading being carried, but would not pledge themselves to support the bill, at any rate in its present form. The scientific statements for which Lord Dawson had vouched were based on cases where one assumed the tests had been done by people of great skill and experience. Would this always be so, and was there not a chance that in a certain proportion of cases mistakes would be made? The eminent pathologists who had been advising the Home Office had suggested that under certain conditions it might be advisable for a further sample of the three bloods to be sent to another institute for an independent check. A mere suggestion of this sort was enough to lead one to conclude that the first test by the approved person might be doubtful, and if there had to be a second test, the trouble and expense and delay would greatly be increased. Seeing that it was only in a third of the genuinely contested cases that they would get a useful result, the matter ought to be carefully considered by a select committee.

CANCER TREATMENT

In the House of Commons on Feb. 13 the Cancer Bill was considered in Committee. Sir H. MORRIS-JONES moved an amendment to clause 1, which deals with the duty of local authorities, to enable medical men to send cases to hospital for investigation as well as treatment. He said that he was anxious to encourage all medical men, especially in the rural districts, not to be afraid of sending cases of suspected cancer to hospital, even though they might not be quite satisfied in their own minds that it was cancer.—Mr. ELLIOT, Minister of Health, said he had no very strong objection to the amendment, but he thought the point could better be met under the subsection which dealt with the arrangements for facilitating diagnosis and treatment. The amendment was accordingly withdrawn.

Mr. ELLIOT said he thought it was the general desire of the House that consultation should take

place between those engaged in every aspect of the treatment of cancer, and should not be limited to radium treatment, if full advantage was to be taken of the money and skill which were to be put at the disposal of cancer patients in the future. On consideration he had decided to omit statutory consultation with the Radium Commission from the Bill. Some consultation, however, must take place, because it would be undesirable that the Minister should himself decide all these matters. He proposed to appoint a subcommittee of the existing Medical Advisory Committee to advise him on general principles in regard to the treatment of cancer. This subcommittee would include experts in surgery, medicine, gynæcology, radium therapy, pathology and public-health administration. His idea was that the authorities should draw up their schemes and submit them to the Minister, who in considering them would have the advantage of the best technical opinion. It would be best for local authorities when drawing up their schemes not to consult this subcommittee but to take into consultation anybody whose advice they wished to have, such as the representatives of voluntary hospitals and medical practitioners. He hoped that this would meet the fear of some hon. Members that radium was given too prominent a place in the bill, and that local authorities were going to be put under a technical commission.—Sir F. FREMANTLE said he would like some further explanation of the subcommittee which was to be set up and also some assurance that the procedure would not lead to delay.—Mr. GRAHAM WHITE welcomed the Minister's scheme for consultation. The Radium Commission, he said, now disappeared from the bill, and while no-one criticised the manner in which it had discharged its duties, nobody would suggest that it was a suitable body to direct a national campaign against cancer.

Colonel NATHAN said that the British Hospitals Association held the view that while the setting up of an advisory committee was a wise step, the membership of the committee should not be restricted to those who could advise on the technical aspects of diagnosis or treatment. Matters of a purely administrative and practical character would have to be considered. The voluntary hospitals therefore felt that they should be represented on the committee.—Mr. ELLIOT said that there was a danger of getting themselves so entangled in committees that the work might be impeded. Therefore he would not like to pledge himself to accepting a consultative committee for the voluntary hospitals. He would, of course, have full discussions with the hospitals on any matters which concerned them.

Mr. GRAHAM WHITE moved an amendment substituting for the Minister's proposal of an advisory subcommittee a national council representing physicians, surgeons, radiologists, pathologists and biochemists. Such a body, he said, would have greater prestige than a subcommittee, and would be more effective and efficient.—Sir F. FREMANTLE said he believed that there had been consultations between the Minister and the British Medical Association and he would like to be satisfied that the B.M.A. had put forward proposals for the general practitioner to be included. There should be a scheme by which local authorities would be guided in the earliest stages of their proposals.—Mr. ELLIOT thought that the bill as it was would conduce to what hon. Members had in mind—namely, informal consultation when the schemes were in the initial stage. There was a statutory provision for consultation between the local authorities and the general practitioners. The review of schemes by those looking at them from a rather wider aspect would be secured by dovetailing the subcommittee and the Medical Advisory Committee, for that body included the presidents of the Royal College of Physicians, the Royal College of Surgeons, and the Royal College of Obstetricians and Gynæcologists, and the chairman of the British Medical Association.

NOTES ON CURRENT TOPICS

Workmen's Compensation

In the House of Commons on Feb. 8 Mr. ARTHUR HENDERSON moved a resolution on behalf of the Labour Party welcoming the appointment of a Royal Commission to inquire into workmen's compensation, but expressing the opinion that legislation should be enacted without delay for an immediate increase in the compensation payable.—Sir ARNOLD WILSON moved an amendment that the House relied on the Commission to proceed with its work as quickly as possible and to consider the issue of an interim report on the more urgent questions, including the rates of compensation. The House would stultify the Commission if it proceeded forthwith to deal with one side only of the question by legislation. Full payment for all costs of medical rehabilitation was the rule in most of the great industrial countries with which we were in active competition. The necessity for it was indicated by Dr. D. C. Norris, chief medical officer of the Bank of England, in the "Encyclopædia of Medical Practice."

"In Great Britain," said Dr. Norris, "employers as such are under no legal obligation to provide or pay for treatment. Recovery is often retarded because the workman is unable to obtain sufficient food or to pay for treatment out of his compensation money."

The important thing was not to give every workman more cash compensation, irrespective of his accident or family or marital condition, as the Labour Party had suggested in successive bills, but to provide for complete medical treatment free of cost. Although employers and workmen paid for national health insurance an injured workman could not draw any cash benefit at all; he could draw nothing but medical benefit. He might need convalescent treatment, artificial limbs, crutches, a wheel-chair, X-ray therapy, or massage, but if he could not get them from some charitable society he could not get them at all, unless he could pay for them, which was usually impossible.—Mr. G. LLOYD, Under-Secretary, Home Office, replying for the Government, said that it was ridiculous to try to deal with the complicated question of workmen's compensation by attempting an immediate solution of a particular part of the problem without waiting for the result of the Royal Commission's investigation. The motion was negatived by 135 votes to 134.

QUESTION TIME

WEDNESDAY, FEB. 8

Medical Examination of R.A.F. Apprentices

Mr. KIRBY asked the Secretary of State for Air whether he was aware that applicants for apprenticeships in the Royal Air Force were given medical and educational examinations near their homes, and if such were successfully passed they were then required to proceed to Halton or West Drayton for further examinations; that this sometimes necessitated the applicants relinquishing their employment, and if they were unsuccessful in the later examinations they found themselves deprived of their former employment as a result of their effort to serve King and Country; and could he so arrange final examinations as to avoid applicants having to give up their employment before being accepted for service.—Sir KINGSLEY WOOD replied: I am aware of the difficulty to which the hon. Member refers and steps are taken to overcome it as far as practicable. All candidates are advised to have a preliminary medical examination at home which many local education authorities are also willing to arrange. This preliminary examination is arranged with a view to minimising the risk of subsequent rejection, but it will be appreciated that it does not remove the necessity for an official medical examination of all candidates. It is not practicable, for many reasons, to arrange a wide distribution of Royal Air Force medical boards for the purpose of examining candidates near their homes. A medical board has been set up in Scotland in

order to relieve Scottish candidates of the necessity of travelling to England for the sole purpose of medical examinations.

Malnutrition in Fernando Po

Dr. HADEN GUEST asked the Secretary of State for the Colonies whether he was aware that among a party of 75 British subjects recently returning from the Spanish island of Fernando Po to Calabar in Nigeria, after a period of labour on the cocoa plantations, one person was found dead of starvation, three were found so ill from starvation as to require a fortnight's treatment in hospital, and the remainder were in a serious condition of neglect and malnutrition; and what steps had been taken to secure improvement in the conditions of labour contracts entered into by British subjects in Fernando Po.—Mr. MALCOLM MACDONALD replied: I am informed that three cases of death due to asthenia occurred about a year ago among 49 persons who returned to Calabar from Fernando Po in very poor physical condition. Since that date an improvement has been reported in the treatment of labour in Fernando Po. Representations have been made by the British vice-consul in Santa Isabel concerning the position of labourers from Nigeria and an assurance has been given by the governor-general of Fernando Po that it was the wish of the authorities to provide for the good treatment of all classes of labourers and especially of those coming from Nigeria as the local farming community was to a great extent dependent on the latter. From independent inquiries which the vice-consul has been able to make it appears that the treatment which the labourers are now receiving has been much improved.

THURSDAY, FEB. 9

Cost of Living Inquiry

Miss WILKINSON asked the Minister of Labour when he estimates the result of the recent inquiry into the cost of living would be available; and when it was proposed that they would be the basis of the official index statistics.—Mr. ERNEST BROWN replied: The tabulation of the data contained in the budgets which have been collected by means of this inquiry is proceeding as rapidly as possible, but I regret that I am not yet in a position to state by what date statistics summarising the information obtained will be ready for publication. The revision of the basis of the cost of living index cannot be undertaken until a summary of the results of the inquiry is available. As I have previously stated, over 50,000 budgets giving particulars of full weekly expenditure, and over 150,000 returns of weekly expenditure on clothing, have been collected. The examination and tabulation of this material is a task of great magnitude, but every effort is being made to expedite the progress of the work with a view to the publication of the results of the inquiry at the earliest possible date.

Diphtheria Immunisation

Captain ELLISTON asked the Minister of Health whether his attention had been drawn to the campaign against diphtheria immunisation; and whether he would issue some statement in support of local health authorities who invited the public to accept this effective protection against a dangerous disease.—Mr. ELLIOT replied: I am aware that there is a body of opinion in the country which is opposed to inoculation in all forms. A memorandum on the production of artificial immunity against diphtheria was issued by my department in 1932, and the question of its reissue in a revised form is receiving consideration. Attention has also been drawn to the value of diphtheria immunisation in recent reports of the chief medical officer of the Ministry.

Mentally Defective Children in Kent

Mrs. ADAMSON asked the Minister of Health whether he was aware of the inadequate accommodation provided by the Kent county council for mentally defective children, and that at a recent meeting the Dartford and district guardians committee, because of numerous complaints, requested the Kent county council to provide extra facilities for such children in north-west Kent; and whether he would take the matter up with the Kent county council so that suitable provision for this rapidly growing area might be made.—Mr. ELLIOT replied: Yes, sir. The Board of Control have for some time been in communication with the Kent county council on the need for further accommodation for mental defectives, especially children, now in public-assistance institutions. I am informed that the extensions at Leybourne Grange mental-deficiency colony are being expedited, with the result that two villas for children are expected to be ready during the coming summer.

MONDAY, FEB. 13

Government Camps for Civilians

Sir ARCHIBALD SOUTHBY asked the Lord Privy Seal whether he was in a position to make any announcement with regard to the provision of camps by the Government for civilian use.

Sir JOHN ANDERSON: Yes, Sir. It has been decided to introduce legislation at an early date providing for the establishment of public corporations, profit barred—one for England and Wales and one for Scotland—which would be empowered to construct and manage camps. The Chancellor of the Exchequer has agreed to make available a sum of £1,000,000 with which, if Parliament approves, a start will be made on a programme of 50 camps each designed to accommodate about 350. They would be hutted camps and would be a useful supplement to billeting under any evacuation scheme in the event of war. Their main peace-time purpose would be to serve as school-camps taking children from urban areas in relays. The corporations will be required to aim at recovering, in respect of the peace-time use of the camps, 50 per cent. of the capital—in addition, of course, to meeting all their maintenance charges. A bill is being drafted and will be introduced as soon as possible. Pending its enactment, preliminary steps are at once being taken for the selection of a sufficient number of suitable sites.

Advertisements of Cancer Treatment

Mr. LEACH asked the Minister of Health whether he would consider supplying, in a parliamentary paper, the information in the possession of his department as to the extent to which advertisements offering to treat persons for cancer were inserted in the public press, and cases of cancer were receiving treatment by irregular practitioners of medicine.—Mr. BERNAYS replied: The information in the possession of my department is that advertisements offering to treat persons for cancer are now seldom or never inserted in the public press. My right hon. friend has no detailed information as to the extent to which cases of cancer are receiving treatment by irregular practitioners.

Supplies of Strychnine to Farmers

Mr. HOPKIN asked the Minister of Agriculture if his attention had been drawn to the enormous damage done to land in West Wales by moles, and to the high charges made for substitutes for strychnine, making the use of such substitutes almost prohibitive to farmers; and would he take steps to enable farmers to procure sufficient quantities of strychnine to clear the moles from their land.—Sir R. DORMAN-SMITH replied: A complaint has recently been received from one farmer in West Wales about the damage caused by moles and the high cost of substitute for strychnine used in the destruction of moles. The view hitherto held by my department is that red squill, which can be obtained easily and cheaply and is comparatively harmless to other animals, is an effective substitute, but I am arranging for field experiments to be undertaken to test the effectiveness of this and other substitutes for strychnine. I should not feel justified in asking the Poisons Board to recommend the relaxation of the present rule with a view of enabling farmers to obtain strychnine for mole destruction.

TUESDAY, FEB. 14

Emergency Hospitals in War-time

Sir GIFFORD FOX asked the Secretary of State for War if he could now make a statement as to the result of his consultation with other interested departments as to the acceptance or refusal of offers of buildings for emergency hospitals in time of war; and whether he would state which these departments were and who ultimately decided

on acceptance or refusal.—Mr. HORE-BELISHA replied: The limited number of the buildings in question which appear suitable will be inspected. The buildings which, after inspection, are found suitable will be notified to the Ministry of Health or the Department of Health for Scotland and the Office of Works, and, subject to their agreement, will be earmarked. In the case of buildings found not to be suitable for the War Office, the suggestion is made that the offers might be renewed to the Ministry of Health or the Department of Health for Scotland. My hon. friend will understand that the War Office is providing its own basic requirements for hospital accommodation independently of these offers.

Conditions in Coastal Ships

Mr. BEN SMITH asked the President of the Board of Trade, whether his attention had been drawn to the annual report of the Port of London medical officer of health 1937, in which reference was made to unhygienic accommodation, inadequate provision for the storage of food, cramped living quarters, excessive hours of work, and other unsatisfactory conditions, on vessels engaged in the coasting trade; and whether, in the interests of health and hygiene, he proposed to initiate remedial action.—Mr. OLIVER STANLEY replied: I have seen this report. The general conditions of service in the coasting trade, as in other parts of the mercantile marine, are primarily matters for the National Maritime Board, on which employers and employed are represented. As regards crew accommodation, a very satisfactory standard for new ships was established by the revised instructions of 1937. Every effort is being made to bring the older ships as far as practicable up to a similar standard. Close contact in this matter is maintained between the Board of Trade surveyors and the port health officers, and steady progress is being made.

MEDICAL NEWS

University of Cambridge

Sir Henry Dale, F.R.S., director of the National Institute for Medical Research, has been elected an hon. fellow of Trinity College.

Titles of the degrees of M.B., B.Chir. have been conferred on E. F. Graham Kerr, J. M. E. Hannaford, and M. Lloyd; and of M.B. on D. K. Souper.

At recent examinations the following candidates were successful:—

D.M.R.E.

Part I—H. N. Bhatt, R. B. Boal, J. P. Bostock, A. H. Brockbank, F. M. Crawshaw, J. A. G. Hair, W. G. S. Harden,* Charles Harris, T. M. Hennebry,* E. C. Hicks, C. W. Horncastle, K. A. Kassem, C. F. MacGuire, S. A. Maddocks, H. M. Marks, R. T. Marshall, M. P. G. O'Brien, G. F. Rees-Jones,* Zoe C. Rutherford, Eric Samuel, Ida B. S. Scudder, K. V. Shetty, J. L. Treneman, A. C. R. Wakeman,* and A. B. Wayte.

* Awarded distinction

University of London

The following have been appointed staff examiners for medical degrees for 1939:—

Anatomy.—Prof. C. M. West and Prof. T. Nicol.

Applied Pharmacology and Therapeutics.—Prof. A. J. Clark, F.R.S., Dr. Philip Hamill, Prof. F. R. Fraser, and Dr. C. E. Lakin.

Forensic Medicine and Hygiene.—Dr. J. H. Ryffel, Dr. W. H. Grace, Dr. G. F. Buchan, and Sir William Jameson.

Medicine.—Sir Charles Wilson, Prof. W. H. Wynn, Dr. C. M. Hinds Howell, and Prof. O. L. V. de Wesselow; Dr. E. A. Cockayne, Dr. K. Shirley Smith, Dr. K. E. Harris, and Prof. C. B. Perry (associate examiners).

M.D. Hygiene.—Sir William Savage and Prof. M. Greenwood, F.R.S.; Dr. William Gunn (additional examiner).

Neurology.—Dr. Macdonald Critchley and Dr. Anthony Feiling.

Obstetrics and Gynæcology.—Mr. Frank Cook, Prof. J. McGibbon, Dr. J. M. Wyatt, Mr. F. W. Roques, and (if required) Mr. Alan Brews; Mr. Malcolm Donaldson, Mr. D. H. MacLeod, Mr. J. W. Burns, Prof. Amy Fleming, and (if required) Mr. A. Goodwin (associate examiners).

Ophthalmology.—Mr. C. B. Goulden and Mr. R. Foster Moore.

Oto-rhino-laryngology.—Mr. W. G. Howarth and Dr. Douglas Guthrie.

Pathology.—Prof. J. Shaw Dunn and Prof. W. W. C. Topley, F.R.S.; Prof. J. H. Dible and Dr. R. W. Scarff (associate examiners).

Pharmacology.—Prof. W. J. Dilling and Dr. V. J. Woolley.

Physiology.—Prof. H. P. Gilding and Prof. Winifred Cullis, D.Sc.

Psychological Medicine.—Dr. R. D. Gillespie and Dr. N. G. Harris.

Surgery.—Prof. P. T. Crymble, Mr. C. Jennings Marshall, Mr. C. E. Shattock, Mr. C. W. G. Bryan, and (if required) Mr. Julian Taylor; Mr. R. H. Boggon, Mr. Stanford Cade, Prof. S. G. Barling, Mr. J. P. Hosford, and (if required) Mr. Nils Eckhoff (associate examiners).

Tropical Medicine.—Dr. N. Hamilton Fairley.

The following examiners for academic diplomas have been appointed:—

Bacteriology.—Prof. H. Raistrick, F.R.S., Prof. W. W. C. Topley, F.R.S., Prof. G. S. Wilson, and Prof. S. P. Bedson, F.R.S.

Medical Radiology.—Part I: Prof. F. L. Hopwood, D.Sc., Mr. W. V. Mayneord, or failing him, Mr. H. T. Flint, D.Sc., and Prof. E. A. Owen, D.Sc. Part II: Dr. Douglas Webster, Dr. H. Courtney Gage, and Dr. R. S. Paterson.

University of Sheffield

Dr. R. S. Kennedy, medical superintendent of the South Yorkshire Mental Hospital, has been appointed lecturer in mental diseases in the university.

University of Manchester

Mr. Gordon Ashcroft has been appointed clinical lecturer in oral surgery and Dr. Robert Newton, assistant lecturer in obstetrics and gynæcology.

Royal College of Surgeons of England

At a meeting of the council held on Feb. 10, with Mr. Hugh Lett, the president, in the chair, Dr. Royal Whitman of New York was admitted to the honorary fellowship of the college.

At the recent primary examination for the fellowship held in Cairo, 10 out of 27 candidates were approved.

It was reported that Prof. René Leriche of Strasbourg would deliver the Lister memorial lecture on Wednesday, April 5.

A diploma of fellowship was granted to Herbert Cecil Perera Gunewardene (Ceylon and St. Bart's) and diplomas of membership were granted to F. T. Birkinshaw (Birmingham and Univ. Coll.), Harry Harris (West London), J. J. H. Lowe (Durh.), and to those candidates mentioned as receiving the licence of the Royal College of Physicians in our issue of Feb. 4, p. 302. Diplomas in public health, tropical medicine and hygiene, and anæsthetics were granted to the candidates mentioned on the same page. Diplomas in medical radiology were also granted, jointly with the Royal College of Physicians, to G. A. Amm, Martin Israelski, F. H. Kemp, and John French.

Royal College of Physicians of Edinburgh

A quarterly meeting of the college was held on Feb. 7 with Dr. Alexander Goodall, the president, in the chair. Dr. Ernest Chalmers Fahmy (Edinburgh), Dr. Ian Dalgleish Easton (Edinburgh) and Dr. James Gilbert Murdoch Hamilton (Edinburgh) were introduced and took their seat as fellows of the college. Dr. John Gordon Kininmonth (Edinburgh) and Dr. Alex. Colin Patton Campbell (Edinburgh) were elected to the fellowship.

Dr. Henry Yellowlees was appointed the Morison lecturer for 1939.

Royal Institute of Public Health and Hygiene

Mr. Walter Elliot, the Minister of Health, will preside over the public health congress to be held by the institute at Hastings from May 23 to 27.

Society of Public Analysts

The annual meeting of this society will be held on Friday, March 3, at 5 P.M., at the Institute of Chemistry, 30, Russell Square, London, W.C.1. At 6 P.M. Sir Henry Dale, F.R.S., will give an address on biological standardisation.

Royal Statistical Society

The council offer the Frances Wood prize, which is of the value of £30, for competition in 1939. It will be awarded for the best investigation, on statistical lines, of any problem affecting the economic or social conditions of the people. Further information may be had from the hon. secretaries of the society, 4, Portugal Street, London, W.C.2.

Lectures on Sex Education

Prof. Winifred Cullis, D.Sc., will deliver the Christine Murrell lecture at the Sieff Hall, Salisbury Street, London, N.W.8, on March 6 at 5 P.M. The lecture will be an introduction to four lectures on problems of sex education to be given by Dr. Doris Mart on March 13, 20, 27, and April 3 at 5.30 P.M. Further particulars may be had from the hon. organiser, 2, Abbey Road Mansions, N.W.8.

Hospital Almoners' Association

The annual dinner of the association took place on Feb. 11, when Miss Warren, chairman of the association, presided. In proposing the toast of The Association, Sir Arthur MacNalty said that a striking feature of the modern outlook on disease was the public recognition of the social and economic effects which follow in its train. For disease was no longer purely a matter of medical significance and relegated entirely to the physician and the surgeon, and the great advances made in the diagnosis and treatment of disease would too often prove to be Cadmean victories, unless the sociological side of the patient received attention. The almoner's work was of cardinal importance in making medical treatment successful, for it was of no use to heal a patient and then to throw him back into the difficulties and conditions which favoured his ill health. Mr. E. C. Bligh, the chief officer of public assistance to the London County Council, who replied to the toast of The Guests, emphasised the increase in the numbers of qualified almoners employed in municipal hospitals.

Hunterian Society: Annual Dinner

Mr. Andrew McAllister presided at the annual dinner of the Hunterian Society held at the May Fair Hotel on Feb. 9 to commemorate the 211th birthday of John Hunter. Proposing The Hunterian Society, Sir Arthur MacNalty said that the society, founded in 1819, had an honourable and distinguished record of service to the progress of medicine. Hunter would have desired no better memorial. He might well, if he had been present and seen the ladies, have declared "I should have been informed of this kick-up!", but a few minutes would have convinced him that their presence added charm to the proceedings. It was desirable that the private medical practitioner should retain his individuality, and that the principle of free choice of doctor and the confidential relationship of doctor and patient should remain undisturbed. Replying, the President said the membership was 337—not quite a record, but satisfactory. Prof. L. S. Monckton Copeman had been made an honorary fellow in recognition of his great services to science and public health. The gold medal of the society had been awarded to Dr. J. E. Outhwaite of Leeds, for his essay on the treatment of inoperable carcinoma in general practice, which he had identified by the motto "Pereunt et imputantur." Amid acclamation, the President presented the medal to Dr. Outhwaite. Dr. Kenneth McFadyean, who proposed the health of The Lord Mayor and the Corporation of the City of London, wished his Lordship a speedy recovery in health and thanked him for sending the lady mayoress as his representative. He observed that an institution as ancient and stable as that of the mayoralty of the City demanded, especially in the present day, an instant loyalty. Its stability was largely due to the democratic system by which the mayor and corporation were elected yearly, and which had been founded, curiously enough, by the tyrannical King John. He regretted that the Lord Mayor's Show had not since 1851 been held on the river, and hoped the day would come when, as before, English summer skies would look down on that splendid pageant. Sir Girling Ball proposed The Guests and Kindred Societies. He recalled the days soon after the late war when the members of the society could be numbered on one hand and it had nearly ceased to exist, and said that nothing gave him greater pleasure than its tremendous success. Prof. Fletcher Shaw, in reply, said he was representing the Royal College of Obstetricians and Gynæcologists for the first time since it had received the royal title. The society must have been formed by many men who had personal connexions with Hunter. Tradition was a great factor in professional life, and he hoped that his college, new as it was, would have its foundations laid so well that future generations would think them worthy to be held as traditions. Mr. R. de la Bere, M.P., also replied.

National Nursing Need

Queen Mary attended a meeting for the recruitment of nurses at the Guildhall on Feb. 11 to hear the Archbishop of Canterbury read her message appealing to the young women of the country "to ask themselves whether they may not find in this great profession not only a career of interest and usefulness but one of the truest and noblest forms of national service." Mr. H. L. Eason, F.R.C.S., principal of the University of London, said that the medical profession needed the help of nurses more and more, for surgical and medical treatment was getting more complex, and more after-treatment was required. Today there was only about one nurse to every 500 of the population and more than that was required to look after the public needs. Miss Reynolds, matron of the London Hospital, Miss Merry, London inspector of the Queen's Institute of District Nursing, Miss Hayter of the London County Council nursing service, and Miss Helen Few, a student nurse at the London Hospital, each described a different aspect of the nurse's life and stressed the scope of the profession and the many forms of satisfying service which it offered.

Some 1500 schoolgirls and members of youth organisations from all over the country were present, and an overflow meeting over which Mr. H. S. Souttar presided was held in the council chamber.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED FEB. 4, 1939

Notifications.—The following cases of infectious disease were notified during the week: Smallpox, 0; scarlet fever, 1690; diphtheria, 1241; enteric fever, 20 (38 "expected"); pneumonia (primary or influenzal), 1435; puerperal pyrexia, 151; cerebro-spinal fever, 37; acute poliomyelitis, 8; acute polio-encephalitis, 3; encephalitis lethargica, 4; dysentery, 19; ophthalmia neonatorum, 104. No case of cholera, plague or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Feb. 10 was 3256, which included: Scarlet fever, 629; diphtheria, 942 (carriers, 48); measles, 2; whooping-cough, 769; puerperal fever, 21 mothers (plus 14 babies); encephalitis lethargica, 301; poliomyelitis, 3. At St. Margaret's Hospital there were 27 babies (plus 12 mothers) with ophthalmia neonatorum.

Deaths.—In 126 great towns, including London, there was no death from smallpox, 3 (0) from enteric fever, 4 (0) from measles, 1 (0) from scarlet fever, 22 (3) from whooping-cough, 33 (7) from diphtheria, 55 (21) from diarrhœa and enteritis under two years, and 210 (26) from influenza. The figures in parentheses are those for London itself.

Of the 210 deaths attributed to influenza 53 were reported from the South-eastern Area; 117 from the Northern Area, Manchester contributing 19, Bolton and Preston each 6, Oldham, Southport and Sheffield each 5; and 25 from the Midland Area, Bristol contributing 5; Lincoln and Exeter each reported 4. Fatal cases of diphtheria were scattered over 18 great towns, Liverpool and Middlesbrough each reporting 3. Bolton had 2 deaths from measles, Birmingham 2 from whooping-cough. East Ham, Manchester and Sheffield reported deaths from enteric fever.

The number of stillbirths notified during the week was 227 (corresponding to a rate of 37 per 1000 total births), including 36 in London.

OBITUARY

CHARLES CYRIL OKELL

M.C., M.B., SC.D. CAMB., F.R.C.P.

Dr. C. C. Okell died at Chesterton, near Cambridge, on Feb. 8 at the early age of 50. A premature retirement from active work had followed a long and painful malady; but he was still exerting an influence that can ill be spared.

Born in the Isle of Man, elder son of C. P. Okell, he was educated at Douglas grammar school and St. John's College, Cambridge, going on to St. Bartholomew's Hospital where he won the Hichens and Wix prizes and the Brackenbury scholarship in medicine. The war came when he was near qualification and he stayed to fill a house-surgeonship before taking a commission in the R.A.M.C. He served with distinction in France, Palestine and Egypt, and was awarded the Military Cross.

[*Lafayette*

When the war was over he turned to the laboratory in preference to the wards and joined the staff of the Wellcome Physiological Research Laboratories. Here the work, in collaboration with others, suited him well, for he was by nature sociable and enjoyed discussing what he was doing. The quantitative methods demanded in the assay of immunological reagents suited his clear and critical mind, and in after years he often stressed the value of such a discipline to the bacteriological investigator. With his colleagues at the Wellcome laboratories he played a large part in the development in this country of prophylactic immunisation against diphtheria and scarlet fever, and helped to maintain the tradition that work of this kind, whether in the laboratory or in the field, demands the same critical approach, the same careful checking of results, and the same striving after fuller knowledge and improved technique as any other scientific activity. During this period he published many papers, some alone but mainly in association with one or more of his colleagues, and particularly with H. J. Parish. These include studies on the relation of virulent to avirulent diphtheria bacilli, on the technique of virulence testing, on the titration of scarlatinal antitoxin and of tuberculin, and field studies on the duration of the Schick-negative state, on the occasional occurrence of diphtheria in Schick-negative reactors, and on the most effective method for the rapid control of diphtheria in residential schools. With A. T. Glenny he examined the Ramon flocculation test for diphtheria antitoxin, and with Hindle and others he essayed the possibility of vaccination against yellow fever. He also described, in collaboration with Dalling and Pugh, the occurrence of leptospiral jaundice in dogs.

In 1920 Okell was appointed to the chair of bacteriology at University College Hospital. He took to the new life at once, and proved his fitness for it. He was an admirable teacher, and felt the stimulus of contact with young and active minds. He had the gift of expounding a difficult subject clearly, without false simplification, and of synthesising a mass of facts and observations into a coherent picture which, however tentative it might be, gave precision to further inquiry. An example of his skill in this direction is afforded by his Milroy lectures, delivered before the Royal College of Physicians in 1932. Though teaching and administrative duties took much of his time and thought he never abandoned research, and he continued to prove his ability to select significant problems, and to solve them. His papers with T. R. Elliott on the transient bacteræmia that follows the extraction of septic teeth, and on the frequency of cross-infection with streptococci in hospital wards, are contributions of the first importance to our knowledge of the mechanisms of infection in man.

Okell's interests were very wide, and he had a lively as well as an able mind. He had a scholar's knowledge of his own subject, and a reader's knowledge of much that lay outside it. From his student days he was keenly interested in Anglo-Saxon and medieval literature and he made himself an authority on Marlowe and his contemporaries. His first venture as an author was a delightful little "History of Fine Linen," written for one of the big drapers when he was a medical student. He had a natural gift for writing, and in his latter years did much literary work. He was for some years assistant editor of the *Journal of Pathology and Bacteriology*, and at the time of his death he was editor of the *Journal of Hygiene*. The last four years of his life were shadowed by a progressive arthritis which gradually rendered active work impossible. Those who had the privilege of knowing him will never forget the example of quiet and steady courage that he gave. After a period of almost complete invalidity, which compelled him to resign his chair in London, he moved to Cambridge in 1937. In addition to his literary and editorial work he was beginning, at the time of his death, to take an increasing part in the supervision of Cambridge medical students, who came to him at his house at Chesterton. They gained much from his wide knowledge and experience; and it delighted him to talk of the things he knew and loved to young men who had more time for thought than the overpressed medical students in the London hospitals.

Throughout his life Okell acted on the principle that science, including medical science, is one and indivisible. He held academic research in high respect, and at times displayed a natural leaning towards attacking a problem as an end in itself, apart from its practical applications. But he gave equal rank to accurate clinical observation, and to careful and critical studies in the field of public health. So far as his own subject was concerned, he regarded the problems that faced him at Langley Court, or in Gower Street, as research work having exactly the same general value, and subject to exactly the same general standards, as the investigations of his more academic colleagues; and he showed that adherence to these standards yielded significant results in the field of applied bacteriology as surely as in the more exact sciences.

Medical science is the poorer by his death, and his many friends have suffered a personal loss. Up to

the end a visit to him, or a letter from him, was a stimulus as well as a pleasure.

Dr. Okell married in 1917 Dorothy Gladys, younger daughter of Mr. W. O. Roberts of Loughborough, who survives him with two daughters.

ARTHUR SMITHELLS

C.M.G., D.SC., F.R.S.

Prof. Smithells, who died in London on Feb. 8 at the age of 78, was from 1885 to 1923 professor of chemistry in Leeds and was the means of initiating many generations of medical students in the scientific outlook. In later years when he became director of the Salters' Institute he continued in London to exert the same kind of influence, for it was his duty to find young scientific men of promise to train for posts in the chemical industries. The following appreciation is from one who worked with him in Leeds for over forty years: "Some of us still remember a professor who startled a class after the vacation with his new Viking beard. In 1884, in the chemistry lecture theatre of the Yorkshire College, the little professor stood just above the lecture-desk; in 1885 the new professor, Arthur Smithells, then only twenty-five, stood commandingly above it. Commandingly—that first impression, maturing with the years, of height, handsomeness and personality, remains with all who remember Smithells. Some former students may still recall how they *did* frisk at many lectures and did *not* frisk with him.

"Smithells's personality and his capacity to handle classes did not by themselves draw the spontaneous 'let us go to see Smithells' from former students when they revisited the Yorkshire College (or its lineal descendant, Leeds University) but Smithells also believed, with Baltasar Gracian, that friendship is a second life. Always accessible to all, he was interested in his students both when he was their teacher and afterwards when he was not. His professorship of thirty-eight years helped him to maintain this interest, for he often taught both father and son.

"At a social gathering a young lady was surprised because Smithells did not probe the thermal efficiencies, or inefficiencies, of the Hostel. His students had to learn that his concern for them did not end with enlightenment on Avogadro's Principle or on the scientific spirit in Pasteur, but they soon did learn. Tea, tennis and other social amenities at the professor's own house often helped the learning. Smithells also aided many students along their postgraduate careers.

"He brought with him one friendly feud when he came to Leeds. He was born in Lancashire; he was interested in cricket and—he was in Yorkshire. The friendly gibe that he came to Yorkshire ostensibly to teach chemistry, but in fact to learn how cricket should be played, did not dim his interest in university athletics or leave that interest unappreciated.

"Smithells, who always interested himself in the teaching of chemistry, carefully considered his own lectures. When he established a separate course for medical students he anxiously planned it so that they should benefit fully without any retrospective resentment over what they had been compelled to learn. He carefully designed the laboratory courses for medical students, as he did for all; he also used experimental demonstration freely in his lectures. Nature withholds manipulative skill from some: Smithells himself referred to the only man in Yorkshire who could pour sulphuric acid on blue litmus without turning it red. At his own lectures flames anatomised or turned inside out, substances phosphoresced, and phosphorus glowed or did not glow, just as they should, without any need to correct the eye of sense by the eye of faith.

"And finally Smithells was a sound judge of men, and when he entrusted a task he gave his full confidence. He tried to keep the various departments of science, including medicine, in touch. The age has separated university science into departmental societies. Smithells did not finally secure one scientific society for all departments of science in common, but he has left behind him a great impression of professional attainments, friendliness and personality."

THOMAS FREEMAN LONG

M.R.C.S., J.P.

AFTER a long illness Dr. Long died at Chesham on Jan. 29 at the age of 69. He had been in general practice in the town for over forty years and had played a leading part in its public life. Born at Maidstone he did his medical training at the Middlesex Hospital, qualifying in 1894. Soon after qualification he started practice at Chesham, at first on his own and later with H. L. Cunningham. He was part-time medical officer of health for the district and a magistrate of many years' standing. He was keenly interested in first-aid and was mainly responsible for founding the Chesham division of the St. John Ambulance; for his services as divisional surgeon he was made an honorary associate of the Order of St. John of Jerusalem on his retirement. Dr. Long had seen most of the people of Chesham grow up. He was a familiar figure at their cricket and football matches and a source of sound opinions at their committee meetings. His kindness and sympathy will be greatly missed.

THE LANCET 100 YEARS AGO

February 16, 1839, *p.* 748.

From a lecture on the blood delivered at the College of France by Monsieur Magendie.

But, you will say, must we then prohibit venesection in pleurisy, in pneumonia, &c.; and, if we refuse to employ it in such cases, what treatment is to be adopted in its room? Gentlemen, I will state to you with fidelity my convictions on this point. . . . If bleeding be advised, because it relieves the patient, diminishes the oppression he feels, soothes his pain; and, finally, because patients habitually recover by, or rather after the use of this remedial agent, then, empiric as I am, I admit that we are justified in having recourse to it: nevertheless I must, at the same time, declare that I cannot conscientiously affirm, in the majority of cases, that the malady would not have gone through its periods, and reached a fortunate termination, had venesection not been employed. And my doubts on this head are strengthened by the fact that if, instead of weakening your patient, you support his physical and moral strength, and, watching the disease closely in all its phases, promote the occurrence of favourable crises, and assist Nature (by directing abstinence from solids, and the use of diluents) in overcoming the obstacles she encounters, you frequently see rapid recoveries occur, more rapid even than those witnessed as the sequence of abundant and repeated bloodletting.

THE Index and Title-page to Vol. II, 1938, which was completed with the issue of Dec. 31, is now ready. A copy will be sent gratis to subscribers on receipt of a postcard addressed to the Manager of THE LANCET, 7, Adam Street, Adelphi, W.C.2. Subscribers who have not already indicated their desire to receive indexes regularly as published should do so now.

MEDICAL MOBILISATION

On Wednesday the Minister of Health outlined the plans for the organisation of medical services in time of war to a meeting of representatives of the profession at B.M.A. House. Linked with the regional commissioner's office in each of the twelve regions into which the country is being divided for purposes of civil defence would be the regional headquarters of each of the Government departments responsible for emergency services. The Ministry of Health would thus have a local staff under a senior officer, with a principal medical officer to supervise all the medical services in that area. The medical staff would see that supplies of bedsteads, bedding, dressings, drugs, and other medicaments were available for the medical needs of the regional population.

Mr. Elliot said that there are too many uncertain factors in the situation to make possible a cut and dried scheme to include all doctors. Nevertheless, it is proposed with the aid of the central and local emergency committees of the B.M.A. to earmark as many medical practitioners as possible for certain classes of work for which their services seem likely to be required in the earlier stages of a war. For this purpose doctors can be divided into five groups:

(1) Those who would give full-time service in His Majesty's forces.
(2) Those who would be required for the hospital services either immediately or in reserve (this would include those required for the maintenance of medical education).
(3) Those who would control the first-aid posts.
(4) Medical officers of Government departments and local authorities.
(5) Those who would constitute the medical boards for examining recruits.

There would remain a number of general practitioners upon whom would devolve the responsibility of maintaining the essential services for the civilian population.

As regards the first group the central emergency committee is engaged in determining the quota to be provided by each local committee. When these quotas have been determined the local committees will be asked to suggest the names of the practitioners who should be released for whole-time service with the forces. Practitioners will be consulted before their names are sent in. The second group will consist of practitioners already on the staff of hospitals or having special qualifications for taking up hospital work arising out of air-raid casualties. In this connexion Mr. Elliot said it was intended to remove casualties as soon as possible from the large towns to hospitals in relatively safe situations. The X-ray and other therapeutic equipment of the large town hospitals would be moved before the outbreak of war, or soon after, together with as many as possible of the medical and nursing personnel. As to the first-aid posts, in addition to existing medical units which could be converted with their staffs for use as such posts in an emergency, there would be about 1000 fixed or mobile first-aid posts for which medical practitioners would have to be provided, and some at least of which would need more than one doctor. Thus about 2000 doctors not already attached to existing units will have to be earmarked for this purpose. The doctors will have to give some collective training to the nursing staffs of the posts in peace-time, but generally speaking service at the posts would not take doctors away from their practices. The fourth and fifth groups represent branches of service for which medical personnel would have to be retained. War conditions would throw a great burden upon medical officers of health, and the movement of children from the more congested areas under the evacuation scheme would throw additional responsibilities upon the public-health staffs in the reception areas.

Practitioners engaged whole time in the civilian casualty service would be paid at rates comparable to those they would receive if they had entered the R.A.M.C. Although they would be employed and paid by the local authority or hospital concerned, the Government intended to reimburse the authority or hospital for the extra expense involved, and recognised for this purpose a scale of salaries which for the ordinary medical man would be similar to that of a captain in the R.A.M.C., with a higher rate for specialists or those with special responsibility. Doctors serving at first-aid posts would be paid at the rate of one and a half guineas for two hours, and three guineas for a longer period. In peace-time the practitioners selected to control the first-aid posts would receive a retaining fee from the local authority to cover their services in training nursing personnel.

THE HUNTERIAN FESTIVAL

On Tuesday the Royal College of Surgeons of England held its biennial celebration of the life and work of John Hunter, who was born on Feb. 14, 1728. In the afternoon Mr. W. Sampson Handley delivered the oration entitled "Makers of John Hunter" which appears at the front of this issue, and in the evening the festival dinner was held in the library of the college. Mr. Hugh Lett, the president, was supported by Prof. Grey Turner and Prof. R. E. Kelly, vice-presidents, in receiving the guests, among whom were:—

The Archbishop of Canterbury, the Earl of Athlone, Viscount Hambleden, Lord Roche (treasurer of the Inner Temple), Lord Atkin, Sir William Goschen, Sir Ernest Fass (public trustee), Councillor G. F. Jerdein (mayor of Westminster), Very Rev. Paul de Labilliere (dean of Westminster), Sir Holman Gregory (recorder of the City of London), and Mr. Selskar M. Gunn (president of the Rockefeller Foundation).

Lord Dawson, Sir Farquhar Buzzard (regius professor of medicine in the University of Oxford), Sir Arthur MacNalty (chief medical officer to the Ministry of Health), Sir Humphry Rolleston (chairman of the executive committee of the Imperial Cancer Research Fund), Sir John Megaw (medical adviser to the India Office), Sir Frederick Menzies (medical officer of health to the London County Council), Sir Edward Mellanby, F.R.S. (secretary of the Medical Research Council), Lieutenant-General W. P. MacArthur (director-general of the Army Medical Services), Mr. H. L. Eason (principal of the University of London), and Air-Commodore A. V. J. Richardson (director of medical services of the Royal Air Force).

In proposing "The Memory of John Hunter" (which was honoured in silence) Mr. Lett spoke of Hunter as one who by his genius brought science to surgery which was then only an art and craft. The story of his boyhood, he said, foreshadows the greatness of the work he accomplished as a man. It tells us of his ceaseless interest in beasts and birds, in insects, trees and flowers, of his burning enthusiasm for the study of nature, and of his constant search for the discovery of her secrets that ended only with

his life. He was the first among the great comparative anatomists to show the gradations between the simplest and most complex forms of animal existence, to demonstrate the gradual development from the lowest to the highest forms of life, and to bring the anatomical variations in them all into one great ordered scheme. For him it was but a short step from anatomy to pathology, to attempt to discover within the body the changes that give rise to disturbing symptoms and disordered functions. He could not tolerate vague theories or treatment that was founded on tradition—he tried to find a reasonable ground of fact. When in his dissections he could not find the answers that he sought, he went still further and carried out experiments even on himself. His thirst for knowledge was unquenchable and his energy amazing. At the time of his death there were in his museum no less than 13,682 specimens.

After describing some aspects of this great collection Mr. Lett quoted the famous sentence in Hunter's letter to Jenner, "Don't think—try." The college, he said, had taken these words as its motto in its efforts to develop biological research and thus throw light on some of the many problems that are still unsolved. Over a hundred years ago Sir Benjamin Brodie had predicted that there would be established in the college a school that might be called "the science of life." He prophesied that great practical results would be obtained which would convict those of ignorance and error who thought that physiological research and a scientific view of disease were of little importance to the practical physician and surgeon. Now the college had its research laboratories and its research farm at which results of great practical importance had already been obtained. But apart from these the laboratories had a special value in the opportunities they offered to young surgeons in the scientific approach to surgical problems, in accuracy and observation, and in the latest developments in surgery. Great would have been John Hunter's delight, said Mr. Lett, if he could have seen the splendid results of the work that has been done for certain forms of heart disease: how tissue grafted on to the surface of the heart gives new arteries for old and brings a fresh supply of blood to the muscle of its walls.

Mr. Lett concluded with a few words about the library. The great advances that have been made in every branch of medicine and surgery during the last forty years, he said, had been attended by an ever-increasing flow of printed matter. Periodicals were now so numerous that it was not possible for the college to provide a comprehensive collection of them all. But if a well-stocked library was of great importance to a surgeon it was vital for research. The college therefore proposed to coöperate with two other important medical libraries, concentrating itself on periodicals connected with surgery and research. In this way wasteful duplication would be avoided; each library would have a far larger collection of the literature of its special subjects than before, while the books and periodicals in any one of these libraries would be available to all their readers.

Prof. GREY TURNER proposed The Guests, exercising to the full his privilege as senior vice-president, and disclosing the aim of the banquet to enlarge the influence of the college among the gentry and nobility and "among discerning people whose good opinion we covet." He was happy in his motto for the Hunterian trustees, "It is the glory of God to conceal a thing, but the honour of kings to search out a matter," and he joined in a larger group of trustees all who had a passionate desire to search out nature's secrets and improve the healing art.—Sir HUMPHRY ROLLESTON, who replied for the guests, congratulated them on their selection out of the great company of possible guests, and spoke of the college as a treasure-house of biology and of medical and surgical lore. He recalled former Hunterian orators and the encouragement given by the college to the younger colleges founded later.

The toast of the Hunterian Orator was proposed by Mr. E. PEARCE GOULD, who spoke of the appropriateness of his prenomen as shown by the fact that he had for thirty years enjoyed a world-wide professional recognition. And we shall long remember, he said, how charmingly he carried out his task as orator this afternoon.—Mr. HANDLEY, in responding, remembered teaching Mr. Gould to hold a scalpel, and told the story of Mary Tofts, the clothier's wife, who gave birth at Godalming in 1726 to a litter of rabbits, a claim on which contemporary medical men were sharply divided. Our knowledge of biology had made good progress since then.

MEDICINE AND THE LAW

Trauma and Sarcoma

THE question as to sarcoma following an accident was considered in the Windsor county court on Feb. 8 last. Thomas George Odell, of Langley, Bucks, sought an award under the Workmen's Compensation Act from his employers, the National Adhesives, Ltd., of Slough, paste and gum manufacturers. On Jan. 2, 1932, the applicant, then 17 years of age, fell seven feet from a pile of sacks on to his left knee-cap. The skin was not broken. He consulted his panel doctor, who treated his swollen and painful knee with iodine. He remained at home for a week and then resumed work. He had no further trouble until 1934, but pain in the knee then became so unbearable that he consulted his doctor again. He continued work until January, 1937, with the exception of a day or two off "when the pain was bad." In this latter month he went to the Windsor Hospital, and from there, on Feb. 25, 1937, he was transferred to the West London Hospital. He was then suffering from a painful swelling at the upper end of the tibia. An X-ray photograph was taken and sarcoma diagnosed. On March 9, 1937, the left leg was amputated above the knee-joint, and a pathological examination confirmed the diagnosis. The patient was discharged on April 15, 1937. His claim for compensation was dated Nov. 17, 1938. It was stated by his counsel that his panel doctor was unable to recall any details of the case and had no records; accordingly he could not be a witness.

Mr. Leslie Oliver, F.R.C.S., attached to the London and West London hospitals, said that he saw the applicant on Feb. 25, 1937, and diagnosed sarcoma. Upon pathological examination it was shown that there was a good deal of bony reaction to the tumour, which suggested to the witness that the tumour had taken considerable time to develop. In his opinion the sarcoma had developed as a result of the 1932 injury. His opinion was based on the facts that medical authorities agreed that such tumours followed injury, that the growth had occurred precisely at the site of the previous injury, and that it had coincided with the history given by the applicant. The witness admitted that the swelling in 1932 was consistent with synovitis and that with

a slow-growing sarcoma there would be some swelling and pain from the date of the injury.

Sir Bernard Spilsbury, F.R.C.P., for the employers, gave it as his opinion that the history of the case suggested synovitis due to the applicant twisting his knee on falling. The treatment adopted was consistent with such diagnosis. He would have expected severe injury to the bone causing persistent pain and swelling. The length of time for the growth was extremely unusual. In his view it was a coincidence that the sarcoma had appeared near the site of the original injury. The applicant had only spoken of intermittent symptoms. The sarcoma probably had taken one year to develop.

Judge Cotes-Preedy, K.C., said that in the absence of any medical history from the applicant's medical man he had only conflicting inferences from two specialists and therefore he could only conjecture what the true answer should be. The onus of proof was on the applicant and, that not having been discharged, no award could be made. Moreover the applicant had shown no reasonable cause for his failure to make a claim within six months of the accident.

Appointments

BARCLAY, I. B., M.R.C.S., D.P.H., D.M.R.E., assistant radiologist at the West Middlesex County Hospital, Isleworth.

BOYD, R. P., M.B. Glasg., F.R.F.P.S.G., D.P.H., deputy medical officer of health and assistant tuberculosis officer for Exeter.

CHESTER, A. W., M.B. Durh., junior assistant medical officer at the Redhill County Hospital, Edgware.

CROSS, A. G., M.B. Camb., F.R.C.S., visiting ophthalmic surgeon at the West Middlesex County Hospital, Isleworth.

FROMOW, D. L., M.R.C.S., resident surgical officer at Ingham Infirmary, South Shields.

GUNDERSON, R. W., B.Sc., M.R.C.S., resident medical officer at the Radium Institute, London.

HENRY, R. E., M.B. Sydney, D.O.M.S., medical officer at the children's orthoptic clinic, Royal Eye Hospital, London.

MILNE, MARIAN B., M.B. Aberd., assistant medical officer at the County Mental Hospital, Lancaster.

MOFFAT, R. G., M.D. Manitoba, resident casualty medical officer at the Redhill County Hospital, Edgware.

MORGAN, J. B. S., M.B. Wales, D.P.H., deputy county medical officer of health for Derby.

PATRICK, L. B., M.B. Edin., F.R.C.S.E., M.R.C.O.G., hon. consulting gynæcologist at Rampton State Institution.

PENLON-JONES, RUTH, M.B. Lond., woman assistant medical officer for Rhondda.

St. George's Hospital, London.—The following appointments are announced :—

NICHOLLS, M. F., M.Chir. Camb., F.R.C.S., surgeon ;
RIDDELL, V. H., M.D. Camb., F.R.C.S., assistant surgeon ; and
DOW, JAMES, M.B. Camb., M.R.C.P., resident assistant physician.

Grimsby and District Hospital.—The following appointments are announced :—

TRUEMAN, R. S., M.B. Lond., F.R.C.S.E., resident surgical officer ;
MOORE, W. E. D., M.B. Camb., house-physician ; and
RIDDLE, R. W., M.R.C.S., junior house-surgeon and casualty officer.

Colonial Medical Service.—The following appointments are announced :—

BARWELL, A. H., M.R.C.S., medical officer, Hong-Kong ;
EDDEY, L. G., M.B., medical officer, West Africa ;
GOODMAN, L., M.R.C.S., medical officer, West Africa ;
KERR, W. G., M.B. Edin., medical officer, Kenya ; and
TURNBULL, N. S., M.B. Edin., D.T.M. & H., D.P.H., senior health officer, Nigeria.

Examining Surgeon under the Factories Act, 1937 : Dr. E. R. LOVELL (Knutsford District, Chester).

Vacancies

For further information refer to the advertisement columns

Albert Dock Hosp., Alnwick Road, E.16.—Second res. M.O., at rate of £110.
Barnsley, Beckett Hosp. and Dispensary.—H.P., £150.
Bath City.—M.O., £500.
Baxton, Devonshire Royal Hosp.—Asst. hon. physician.
Bedford County Hosp.—Second H.S., at rate of £150.
Belfast, Queen's University.—Tutor in obstetrics, £300.
Birmingham and Midland Hosp. for Women.—H.S., at rate of £100.
Bradford, St. Luke's Municipal General Hosp.—H.P.'s and H.S.'s, each at rate of £150.
Brighton, Borough Infectious Disease Hosp. and Sanatorium.—Sen. res. M.O., £450.
Bristol Eye Hosp.—Jun. H.S., at rate of £100.
British Postgraduate Medical School, Ducane Road, W.12.—Res. anæsthetist, at rate of £150.
Cannock Urban District Council.—Asst. M.O. and asst. school M.O., £550.
Canterbury, Kent and Canterbury Hosp.—H.S. to spec. depts., at rate of £125.
Cardiff City Mental Hosp., Whitchurch.—H.P., at rate of £200.
Carlisle, Cumberland Infirmary.—H.P. and two H.S.'s, each at rate of £160.
Central London Ophthalmic Hosp., Judd Street, W.C.1.—Sen. and jun. H.S.'s, £120 and £100 respectively.
Central London Throat, Nose, and Ear Hosp., Gray's Inn Road, W.C.1.—Third res. H.S., at rate of £75.
Charing Cross Hosp., W.C.2.—Surg. reg., £150. Also registrar to fracture clinic, at rate of £100.
Chester Royal Infirmary.—H.P., H.S., also H.S. to ear, nose and throat, &c., dept., each £150.
Connaught Hosp., E.17.—Hon. physician.
Croydon County Borough.—Asst. M.O. for obstetrics, £350.
Dorset County.—Asst. county M.O.H., £500.
Dover, Royal Victoria Hosp.—Second R.M.O., £140.
Dreadnought Hosp., Greenwich, S.E.10.—H.S., at rate of £110. Physician with charge of outpatients. Also hon. dermatologist.
Dublin, St. Anne's Skin and Cancer Hosp., Northbrook Road.—Asst. radiologist, £300–£400.
Dudley Guest Hosp.—Res. surg. O., £250–£300. Also H.S., £150.
Ealing, King Edward Memorial Hosp.—Res. M.O., at rate of £275.
Edinburgh City and Royal Burgh.—Depute M.O.H., £900.
Edmonton Borough.—Asst. M.O.H. and asst. school M.O., £550.
Exeter, Royal Devon and Exeter Hosp.—Three H.S.'s and H.P., each at rate of £150.
Exeter, Wonford House.—Asst. M.O., £350.
Grocers' Company, Grocers' Hall, E.C.2.—Scholarship, £300.
Hampstead General Hosp., Bayham Street, Camden Town, N.W.1. Hon. clin. asst. to Ophth. Dept.
Hertford County Hosp.—H.P., at rate of £150.
Hosp. for Consumption and Diseases of the Chest, Brompton, S.W.3.—Med. reg., £150.
Hove General Hosp.—Jun. res. M.O., £120.
Isleworth, West Middlesex County Hosp.—Visiting ear, nose and throat surgeon, 3 guineas per session.
Kettering and District General Hosp.—H.P., at rate of £150.
Kingston-upon-Thames Royal Borough.—Med. asst. to M.O.H., £600.
Leicester, City General Hosp.—Res. M.O., at rate of £300.
Leicester Royal Infirmary.—Two res. anæsthetists, each at rate of £150. Also H.P.'s., H.S.'s., and cas. O.'s, each at rate of £125.
Liverpool Royal Babies Hosp., Woolton.—Res. M.O., at rate of £125.
London County Council.—Asst. M.O.'s (class I), each £350, asst. M.O.'s (class II), each £250.
London Hosp., E.1.—Asst. surgeon. Also res. anæsthetist and first asst. to skin and light therapy dept., each £150.
London Lock Hosp., 283, Harrow Road, W.9.—Res. M.O. to all depts., at rate of £175.
London University.—University chair of medicine at St. Mary's Hosp. medical school, £2000. Also University chair of dental surgery and pathology at Royal Dental Hosp., £1500.
Macclesfield General Infirmary.—Second H.S., at rate of £150.
Manchester, Ancoats Hosp.—Cas. O., £150.
Manchester, Duchess of York Hosp. for Babies.—Jun. res. M.O., at rate of £75.
Manchester Royal Infirmary.—Chief asst. to neuro-surgical dept., £350.
Manchester University.—Lecturer in human physiology.
Margate, Royal Sea Bathing Hosp.—H.S., at rate of £200.
Middlesbrough, North Riding Infirmary.—Sen. H.S., at rate of £175.
Middlesex County Council.—Third asst. M.O. for Middlesex Colony, Shenley, £365.
Nottingham City Council.—Temporary physician, £15 per week.
Oldham County Borough.—Asst. school M.O., £550.
Oldham Royal Infirmary.—H.S., at rate of £175.
Plymouth, Prince of Wales's Hosp., Greenbank Road.—Res. anæsthetist and H.S. to spec. depts, at rate of £120. Also two H.S.'s, each at rate of £120.
Plymouth, Prince of Wales's Hosp., Lockyer Street.—H.S., at rate of £150.
Plymouth City.—Asst. M.O.H., £500.
Plymouth City General Hosp.—Jun. asst. M.O., £250.
Port of London.—Deputy M.O.H., £900.
Prince of Wales's General Hosp., N.15.—Jun. H.P. and two jun. H.S.'s, each at rate of £90. Also Hon. asst. radiologist.
Queen Mary's Hosp. for the East End, Stratford, E.15.—Res. M.O. and cas. O., each at rate of £150. H.P. and H.S., each at rate of £110. Also obstet. H.S., at rate of £110.
Queen's Hosp. for Children, Hackney Road, E.2.—Dental surgeon, £1 7s. 3d. per session.
Redhill County Hosp., Surrey.—Res. asst. M.O., at rate of £250.
Rotherham Hosp.—H.P., £180.
Royal Air Force.—Commissions.
Royal Army Medical Corps, Whitehall, S.W.1.—Supplementary reserve of officers.
Royal Cancer Hosp., Fulham Road, S.W.3.—Asst. physician. Asst. radiologist for therapeutic dept., £350. Also surg. reg. and med. reg., each £150.
Royal Eye Hosp., St. George's Circus, S.E.1.—Sen. H.S. Also two asst. H.S.'s, at rate of £150 and £100 respectively.
Royal Free Hosp., Gray's Inn Road, W.C.1.—Res. cas. O., at rate of £150.

*Royal London Ophthalmic Hosp., City Road, E.C.*1.—Sen. res. officer, at rate of £150.
*Royal Masonic Hosp., Ravenscourt Park, W.*6.—Two res. surg. O's, each at rate of £250.
Royal Naval Medical Service.—M.O.'s.
*Royal Northern Hosp., Holloway, N.*7.—Pathological registrar, £200.
*Royal Waterloo Hosp. for Children and Women, Waterloo Road, S.E.*1.—Anæsthetist, £100.
*St. John's Hosp. for Diseases of the Skin, 5, Lisle Street, Leicester Square, W.C.*2.—Outpatient and inpatient med. registrars, each £50.
St. Mary's Hosp. for Women and Children, Plaistow.—Hon. ophth. surgeon. Also hon. dermatologist for skin dept.
St. Marylebone Borough.—M.O.H., £1350.
Salford Royal Hosp.—H.S., and cas. H.S., each at rate of £125.
Sheffield, Children's Hosp.—H.P., at rate of £100.
Stoke-on-Trent, Stallington Hall Certified Institution, Blythe Bridge.—Med. supt., £800.
Stoke-on-Trent City.—Sen. asst. maternity and child welfare officer, £600.
Swansea General and Eye Hosp.—H.P., at rate of £150.
Tilbury Hosp., Essex.—Med. supt., £200. Also H.S., at rate of £140.
*University College Hosp., Gower Street, W.C.*1.—Two hon. anæsthetists.
*Victoria Hosp. for Children, Tite Street, Chelsea, S.W.*3.—Surgeon to outpatients. Also hon. surg. reg.
Wakefield, Clayton Hosp. and Wakefield General Dispensary.—Res. surg. O., £250.
Wales University.—Mrs. John Nixon Research Scholarship, £150. Lord Merthyr Research Scholarship, £200. Also Ewer Maclean Research Scholarship, £150.
Walsall County Borough.—Asst. M.O.H., £500.
Walsall General Hosp.—Res. surg. O., £300.
Warwick, King Edward VII Memorial Sanatorium, Hertford Hill.—First asst. M.O., £350.
West Riding County Council.—Supervisor of meals, £300.
*Woolwich and District War Memorial Hosp., Shooters Hill, S.E.*18.—Hon. asst. surgeon and hon. asst. obstet. surgeon. Also H.S., at rate of £100.
Worcester County and City Mental Hosp., Powick.—Asst. M.O., £350.

The Chief Inspector of Factories announces vacancies for Examining Factory Surgeons at Uxbridge (Middlesex), Hathersage (Derby), Winsford (Cheshire) and Coupar Angus (Perth).

Medical Diary

Feb. 20 *to Feb.* 25

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1.

TUESDAY.—5 P.M., meeting of fellows.
Pathology. 8.15 P.M., laboratory meeting at group laboratory and central histological laboratory, Archway Hospital, Archway Road, N.19.

WEDNESDAY.
Comparative Medicine. 7.45 P.M. (National Institute for Medical Research, Hampstead, N.W.3), C. H. Stuart-Harris: Neurotropic Strain of Human Influenza Virus. J. R. Perdau: Comparison of Experimental Lesions in Louping-ill and Australian X Disease. F. B. Gordon: Toxoplasma-like Parasite in the White Rat. A. S. Parkes: Experimental Hyperfœtation in the Rabbit. R. E. Glover: Cultivation of the Virus of Aujeszky's Disease.

THURSDAY.
Urology. 8.30 P.M., Mr. D. S. Poole Wilson: The Treatment of the Incompletely Descended Testis. Dr. Ian Donald: New Automatic Bladder Irrigator.

FRIDAY.
Disease in Children. 4 P.M., meeting at the Hospital for Sick Children, Great Ormond Street, W.C.1.
Epidemiology and State Medicine. 8.15 P.M., Dr. Alfred Cox, Dr. Andrew Topping, Dr. Lindsey Batten, Dr. Frank Gray, and Dr. E. R. C. Walker: The Proper Sphere of State Medicine.
Odontology. Combined meeting of Odontological Societies at Birmingham.

ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION.
WEDNESDAY.—2.30 P.M. (11, Chandos Street, W.1), Dr. D. R. MacCalman: Present Status and Functions of the Child-Guidance Movement in Great Britain and its Possible Future Developments. 8.30 P.M., (joint meeting with medical section of the British Psychological Society at B.M.A. House, Tavistock Square, W.C.1), Dr. A. A. W. Petrie, Dr. J. Ivison Russell, Dr. R. D. Gillespie, and Dr. Noel Harris: Mental Nursing.

Pathological, Bacteriological and Biochemical Subcommittee.
TUESDAY.—8 P.M. (Central Pathological Laboratory, Denmark Hill, S.E.5), Dr. A. E. Evans, and Dr. W. M. Ford Robertson: The *Pathological* Significance of Recovery from Long-standing Psychoses.

MEDICAL SOCIETY OF LONDON, 11, Chandos Street, W.1.
MONDAY.—9 P.M., Prof. G. Grey Turner: Surgery of the Gall-bladder and Bile-ducts. (Lettsomian lecture.)

CHELSEA CLINICAL SOCIETY.
TUESDAY.—8.30 P.M. (Rembrandt Hotel, Thurloe Place, S.W.7), Captain Alex. S. Mackay: Lighthouses.

EUSTON MEDICAL SOCIETY.
THURSDAY.—9 P.M. (Euston Hotel), N.W.1, Mr. A. G. Wells: Medical Treatment of Deafness; Mr. H. A. Cowan will show a film of the mastoid operation.

ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY, 5, Lisle Street, W.C.2.
WEDNESDAY.—4.30 P.M., clinical cases. 5 P.M., Dr. F. F. Hellier: Environment and Constitution in Dermatology.

MEDICO-LEGAL SOCIETY.
THURSDAY.—8.30 P.M. (26, Portland Place, W.1), Mr. D. Harcourt Kitchin: The General Medical Council.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.1.
THURSDAY.—5 P.M., Dr. Donald Stewart: Industrial Incapacity and Modern Medicine. (Milroy lecture.)

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane Road, W.12.
TUESDAY.—4.30 P.M., Dr. S. Levy Simpson: Diseases of Endocrine Glands.
WEDNESDAY.—Noon, clinical and pathological conference (medical). 2 P.M., Dr. T. C. Stamp: Passive Immunisation in Therapeutics. 3 P.M., clinical and pathological conference (surgical). 4.30 P.M., Prof. E. C. Dodds: Hormones in Relation to Medicine and Pathology.
THURSDAY.—2.15 P.M., Dr. Duncan White: radiological demonstration. 3.30 P.M., Dr. A. S. Parkes, F.R.S.: The Anterior Pituitary Hormones.
FRIDAY.—2 P.M., clinical and pathological conference (obstetrics and gynæcology). 2.30 P.M., Mr. C. Price Thomas: Empyema and Abscess of the Lung.
Daily, 10 A.M. to 4 P.M., medical clinics, surgical clinics and operations, obstetrical and gynæcological clinics and operations.

TAVISTOCK CLINIC, Malet Place, W.C.1.
MONDAY.—4.30 P.M., Dr. H. V. Dicks: Sexual Maladjustments.
THURSDAY.—4.30 P.M., Dr. T. W. Mitchell: The Psychoneuroses.

ST. GEORGE'S HOSPITAL, S.W.1.
THURSDAY.—5 P.M., Dr. E. Guttmann: psychiatric demonstration.

HOSPITAL FOR SICK CHILDREN, Great Ormond Street, W.C.1.
THURSDAY.—3 P.M., Dr. E. A. Cockayne: The Diagnosis of the Leukæmias in Childhood. 3 P.M., Mr. Charles Donald: Swellings and Sinuses in the Neck.
Outpatient clinics daily at 10 A.M., and ward visits at 2 P.M.

MAIDA VALE HOSPITAL FOR NERVOUS DISEASES, W.9.
THURSDAY.—3 P.M., Dr. Blake Pritchard: clinical demonstration.

HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL, N.W.3.
WEDNESDAY.—4 P.M., Dr. Rickword Lane: Side-room Tests in General Practice.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn Road, W.C.1.
FRIDAY.—4 P.M., Mr. Harold Kisch: Frontal Sinusitis—Diagnosis and Treatment.

NATIONAL HOSPITAL, Queen Square, W.C.1.
MONDAY.—3.30 P.M., Mr. G. Elmquist: demonstration of remedial exercises.
TUESDAY.—3.30 P.M., Dr. Purdon Martin: Neurosyphilis (4).
WEDNESDAY.—3.30 P.M., Dr. F. M. R. Walshe: clinical demonstration.
THURSDAY.—3.30 P.M., Dr. Gordon Holmes, F.R.S.: Cerebellar Tumours.
FRIDAY.—3.30 P.M., Dr. E. A. Carmichael: Deficiency Diseases (2).
Outpatient clinic daily at 2 P.M.

LONDON SCHOOL OF DERMATOLOGY, 5, Lisle Street, W.C.2.
TUESDAY.—5 P.M., Dr. Hugh Gordon: Treatment of Acne.
THURSDAY.—5 P.M., Dr. Arthur Burrows: Malignant Conditions of the Skin. (Chesterfield lectures.)

ST. JOHN CLINIC AND INSTITUTE OF PHYSICAL MEDICINE, Ranelagh Road, S.W.1.
FRIDAY.—3.30 P.M., medical registrars: Electrotherapy and Hydrotherapy in the Rheumatic Diseases.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION.
WEDNESDAY.—4 P.M. (St. James' Hospital, Ouseley Road, S.W.12), Dr. Temple Grey: The Difficulties of Death Certification.

FELLOWSHIP OF MEDICINE AND POSTGRADUATE MEDICAL ASSOCIATION, 1, Wimpole Street, W.1.
MONDAY to SATURDAY.—INFANTS HOSPITAL, Vincent Square, S.W.1, all-day course in children's diseases.—ST. MARY'S HOSPITAL, Paddington, W.2, Tues. and Thurs. 8 P.M., clinical and pathological M.R.C.P. course.—BROMPTON HOSPITAL, S.W.3, 5.15 P.M., twice weekly, M.R.C.P. course in chest diseases. Mon., Wed., Fri., 5.15 P.M., primary F.R.C.S. physiology course at 11, Chandos Street, W.1.—ST. JOHN'S HOSPITAL, 5, Lisle Street, W.C.2, afternoon course in dermatology. (Open to non-members.)

LEEDS GENERAL INFIRMARY.
TUESDAY.—3.30 P.M., Dr. S. J. Hartfall: Some Aspects of the Treatment of Fibrositis and Arthritis.

MANCHESTER ROYAL INFIRMARY.
FRIDAY.—4.15 P.M., Mr. A. Graham Bryce: surgical cases.

GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.
WEDNESDAY.—4.15 P.M. (Royal Maternity and Women's Hospital), Dr. R. A. Lennie: Antenatal Care.

NOTES, COMMENTS, AND ABSTRACTS

THE PREVALENCE OF CONTRACEPTION

RAYMOND PEARL'S STUDY

STUDENTS of population are generally agreed that the decline of the birth-rate in the Western World should be attributed mainly, if not entirely, to the practice of contraception. But it is only within recent years that attempts have been made to ascertain the prevalence of contraception in a given community as a whole or in separate sections, or to relate varying prevalence to differences of economic status, race, or religion. Statistics on such subjects have been published, but for the most part they are based on the records of birth-control clinics, and the women attending these clinics form a selected group, heavily overweighted with multiparæ and of relatively high fertility. Such objections do not, however, apply to a remarkable investigation recently undertaken by Prof. Raymond Pearl, and explained in his Heath Clark lectures delivered in the London School of Hygiene and Tropical Medicine in the autumn of 1937, now published in book form.[1]

The investigation, which in extent and significance is far in advance of anything previously attempted in this field of inquiry, was carried out in 26 large American cities east of the Mississippi and north of the most southern tier of states. The cost of the investigation was largely defrayed by the Milbank Memorial fund. Particulars were obtained of 30,949 women, 25,316 white and 5633 negro, living in these cities each of whom gave birth to a baby in the obstetric department of a hospital during 1931–32, the number of hospitals participating being 139. The particulars included (*a*) the entire reproductive history, (*b*) the use of contraceptives, (*c*) statements concerning health, religion, and racial, educational, and economic status. The information was obtained and recorded by the medical officers of the hospitals, all of whom were specially trained in obstetrics. They worked under the general direction of Prof. Pearl, in whose opinion the data may "be accepted with a considerable degree of confidence as indicative of conditions in the general population, and particularly of the urban population, of the United States."

Two classes of women of childbearing age were, however, not represented in the sample: (1) those physiologically incapable of bearing children, and (2) those voluntarily infertile for the period covered by the investigation. Of the white women, 54 per cent. said that they had never practised contraception, and the investigators found no reason to doubt their statements; 3·2 per cent. said the same, but there were reasons for doubting their veracity; 42·7 per cent. said that they had practised contraception. The corresponding percentages in the negro group were 83·0, 16·4, and 0·6. Pearl gives reasons for thinking that the percentage of white women definitely recorded as practising contraception is below the corresponding percentage for the population from which the sample was drawn, which he estimates at from 55 to 60.

One object of the inquiry was to ascertain the relation between the prevalence and efficiency of contraceptive practice and the fertility of classes differing in economic status, education and religion. This part of the inquiry was restricted to married women living in wedlock, married once only, and free from any gynæcological disease recognisable in the hospitals in which they were delivered. The number of such women was 22,657, of whom 19,613 were white and 3044 negro. They were divided according to economic status into four groups: Very Poor, Poor, Moderate Circumstances, Well-to-do and Rich; and the percentage of white women practising contraception to all white women in their respective groups rose from 30·0 among the Very Poor to 80·1 among the Well-to-do and Rich. There was a similar rise in the efficiency of contraceptive practice measured by postponement of pregnancy, the differences being much greater among multiparæ than primiparæ. The general trend in the negro classes was similar, but there was no negro Well-to-do and Rich class. Reviewing the relation between economic status and fertility, Pearl concludes that:—

"The results of the study make it quantitatively clear that the major factors immediately associated statistically with the observed economic class differential fertility in this American population sample were (*a*) increasing age at marriage with advancing economic position; (*b*) increasing prevalence of contraceptive efforts with advancing economic status; and (*c*) increasing effectiveness of the contraceptive efforts actually made with advancing economic status. The evidence indicates that in the absence of these factors there would be but little if any fertility differential between the several economic classes."

This conclusion is in general agreement with results reached by other workers. The facts elicited about abortion are more surprising. The number of induced abortions (exclusive of abortions induced for medical reasons) per hundred pregnancies experienced in each of the economic groups of white women is set out below:—

—	Totals	Very poor	Poor	Moderate circumstances	Well-to-do and rich
Non-contraceptors	0·7	0·8	0·7	0·4	1·1
Contraceptors ..	2·3	2·4	2·6	2·0	1·0

In Pearl's opinion these results, which are based on the women's own statements, understate the true prevalence of induced abortion. He lays stress on the fact that the data were all derived from married couples living in wedlock; and he is concerned to find that "in this large sample of respectable white married women already shown to be fairly representative of the general population from which it came, those who practice contraception as a part of their sex life, by their own admission resort to criminally induced abortion about three times as often proportionately as do their comparable non-contraceptor contemporaries." The explanation he gives is that "criminal abortion is the last desperate remedy to correct the failure of contraceptive techniques," and he adds that it may reasonably be deduced from his results "that for something like three-quarters of that part of the professional abortionist's business that derives from urban American married women he can thank the birth controllers and the current imperfections in the technique of their art."

Abortion, however, was less frequent among the Well-to-do and Rich class, in which contraception was most prevalent and most efficiently practised, than among the contraceptors of lower economic status, and it is reasonable to infer that if the latter

1. The Natural History of Population. By Raymond Pearl (Johns Hopkins University). Oxford University Press. 1939. Pp. 416. 10*s.* 6*d.*

should reach the standard of efficiency set by the most opulent class criminal abortion would become less frequent among contraceptors generally. In view of the improvements in contraceptive appliances and technique which are now being made under the combined efforts of scientific research and commercial enterprise such a result is not unlikely, and its effect on population growth in the United States, where the net reproduction-rate has already fallen below replacement-rate, would probably be considerable. This, however, is only one of many important questions raised by Pearl's remarkable and significant investigation.

IRON, CALCIUM AND PHOSPHORUS

A JOINT meeting of the Society of Public Analysts and the food group of the Society of Chemical Industry was held on Feb. 1 in the Chemical Society's rooms at Burlington House. The subject dealt with was the analysis and differentiation of the composition of iron, phosphorus and calcium compounds in respect of nutritional requirements. Prof. J. C. Drummond, in introducing the subject, referred to the development of methods of assessing nutritional value since the pioneer work of Liebig. Today the mere determination of the total intake of iron, phosphorus and calcium was insufficient. For example, the nutritional value of iron in red meat was very different from that of the iron in wheat, and methods of estimating "availability" of the iron had assumed great importance. The problems arising in connexion with phosphorus and calcium were in many respects closely interrelated and had an important bearing on the function of vitamin D. At the present time the average intake of calcium and the Ca/P ratios of diets were apparently lower than they used to be and considerably below the optimum values, and this might account for the necessity of supplementing the normal intake of vitamin D by the use of rich sources of this vitamin which formerly were neither necessary nor available.

Speaking on the relation of iron to nutrition, Dr. R. A. McCance pointed out that this metal in the ionisable form—e.g., as mineral salts—was utilisable by the animal body to a much greater extent than the iron in organic combination in hæmoglobin or hæmatin. Since 1930 a means of discriminating between these two forms of combination of iron by means of αα′-dipyridyl, which determined the former but not the latter state of combination, had come into use. Valuable as this method was, a critical examination of the results obtained with it, compared with those of biological assays, showed wide and variable discrepancies. Probably the use of tripyridyl was preferable to that of αα′-dipyridyl, and there was room for great improvement in the methods of biological assay used in this work. It would seem that the iron not determined by αα′-dipyridyl could not be entirely accounted for as hæmoglobin or hæmatin, and the nature of the fraction not accounted for had not yet been ascertained.

Dealing with phosphorus, Prof. H. D. Kay pointed out that in certain respects the nutritive values of phosphorus and calcium were interdependent. In man, about 90 per cent. of the total phosphorus present was in the bones, about 8 per cent. in the muscles, and much smaller quantities in the brain and blood. The presence of precipitants for phosphates in the food ingested might seriously interfere with absorption of phosphorus. This was strikingly shown by recent experiments on the effect of ingestion of beryllium carbonate, which owing to the almost complete insolubility of beryllium phosphate was able to prevent absorption of phosphates present in the food and so give rise to rickets even with diets rich in vitamin D. A similar precipitating action on phosphates would account for the fact that a large excess of calcium in a diet interferes with phosphorus absorption.

Dr. J. D. Robertson, speaking in place of Prof. E. C. Dodds, who was unable to be present, described the procedure employed by them in studying the calcium-balance in human beings over three-day periods, and gave details of the analytical methods employed. The calcium voided in such studies comprised that part of the calcium ingested which had not been absorbed, and also the calcium from the system which had been excreted. Calcium absorption depended on such factors as the composition of the diet, hydrochloric acidity and the presence of certain substances, notably lactose.

"THE STRONGHOLD"

John Quickshott, the hero of Richard Church's new novel of the war years (London: J. M. Dent. 8*s.* 6*d.*), is an over-serious young man who works in the Customs Office and feels the call to be a doctor. He devotes his abundant leisure to securing a degree in physiology and so becomes a medical student. Meanwhile, for no very concrete reason, he parts from his lover, Dorothy Sinmer, a young woman much too good for him who goes to France to do war work, and unknown to John affords him financial help. After many vicissitudes the lovers are reconciled, but sympathy goes out to Dorothy for it is hard to believe that John will become either a good doctor or a good husband. The subsidiary characters are not altogether convincing: Phyllis Drayton, sensual, stupid and patrician, ignorant of the facts of life, seduced by a Guards officer, and dying of postpartum hæmorrhage; Matthew Brennan, purporting to be the perfect "metropolitan" but in fact merely a theatrical figure. Dorothy's cow-like sister Mary and her rather ineffective little husband are more real. We may wonder why a third-year student suddenly puts in six months as a clinical clerk at the Cancer Hospital, or why without so much as the experience of a month on "district" he finds it necessary to apply forceps to a multipara having a slightly premature but otherwise normal labour. The medical reader must be ready to overlook some bad obstetrics and skim over a particularly purple description of an amputation of the breast if he means to enjoy this novel.

A NATIONAL LANGUAGE FOR INDIA

THAT Hindustani will be the national language of India, ousting English from its position as the normal means of both the education and the expression of science, is claimed by Capt. E. S. Gopalan, who advises scientists, especially medical men, in India to learn Hindustani and to publish their papers in that language instead of English (*South Ind. Med.* November, 1938, p. 151). His argument is special pleading based on dubious assumptions. For instance, he says that "Hindustani is really the lingua franca of India"; but surely, writing from Coimbatore, he will be aware that Tamil (a non-Aryan language) is spoken by over 18,000,000 people in India, by many others in Ceylon, and by Tamilians in Assam, Burma, Malaya, and elsewhere. It is the language of the Carnatic coast from Madras to Cape Comorin. Besides Tamil there are three other chief Dravidian languages: (1) Telegu (Andhra), spoken by 24,000,000 people, the language of the Carnatic and northern Circars from Madras to Ganjam; (2) Canarese, spoken by 10,500,000 people in the Deccan, the official language of the state of Mysore; and (3) Malayalam, spoken by 7,000,000 people in Travancore, Cochin, and Malabar—not to mention eleven other Dravidian languages. Where any of these is spoken as the vernacular, English rather than Hindustani is ordinarily used as the link between European and Indian.

Gopalan also claims that "culturally it (India) has been, is, and is going to be one in spite of the apparent diversities in religion and provincial languages." He seems to be one of those who believe in the Aryan myth despite the fact that, according to Slater in his "Dravidian Element in Indian Culture" (1924), the Dravidian element preponderates over all

other elements in the racial make-up of the people of India. Slater (sponsored by no less an authority than Prof. H. J. Fleure) says that the "Indians cling to the theory that they are 'Aryans' and that their religion and culture are 'Aryan.' . . . In India the Aryan theory rests upon a solid basis of sentiment. Indian *amour propre* is gratified by the idea that Indians are Aryans, so to say, of the elder line; British, French, and Germans Aryans of the younger and till lately relatively uncivilised branch."

We should regard it as a retrograde step for English medical publications to be replaced by Hindustani. Science is international and the smaller its confusion of tongues the better for those engaged in scientific work. Moreover it would probably be easier to replace Hindustani by English in northern India than to teach Hindustani to southern India. "The extent to which English has already become the language of South India is amazing," wrote Slater fifteen years ago. Scientific progress is obviously best linked with a language such as English, which, as Gopalan admits, is the best foreign language for the purpose, "as it is handled by the largest number of people in three continents."

PAIN IN CANCER OF THE CERVIX

MODERN methods of treatment have lengthened the period of survival for many sufferers from cancer of the cervix and for that very reason there may be more cases in which pain is a symptom of outstanding importance. J. Ducuing analyses the types of pain encountered and the methods of treatment available (*Tech. chir.* 1938, **30**, 125). He argues persuasively that where death is likely to be delayed for some time and the general health is not much affected the patient should be given the chance of relief offered by one or other of the newer methods, which provide an alternative to opiates. The procedures used with varying degrees of success include injection of alcohol (intraneural, epidural, subarachnoid), sympathectomy, nerve-root section, and chordotomy. The choice between them depends partly on the type and origin of the pain and partly on the general condition. No one method is successful in all cases, and some of them are too risky to attempt where a patient is already very ill. Minor procedures such as intrathecal alcohol injection can, however, be safely performed even in the last stages of cancer and they sometimes give great relief.

ANNUAL REPORT OF A G.P.

IN the belief that the flow of knowledge from hospital to general practitioner may be reversed with profit to all concerned Dr. Trier Hansen, a Danish general practitioner, has published a report on his year's work (*Ugeskr. Laeg.* Jan. 12, p. 47). The cases he saw in his moderately large country practice are classified in alphabetical order in Latin terms, only new cases being included. The first year of life formed one category, and the next thirteen years another. There was one category for women and another for men; one for the cases referred to specialists or ambulatory treatment; one for hospital admissions; one for operations; and one for deaths. Under A, for example, is to be found angina (tonsil) with 3 cases in infancy, 48 in childhood, 49 in women and 38 in men; 2 being admitted to hospital, with 1 death. Next comes ascariasis, represented by 23 cases in childhood and 3 in adult life. The heading nihil is reserved for 3 infants, 4 children, 4 women and 2 men. The alphabetical list ends with various forms of "vulnus." Dr. Hansen gives an imposing list of dental extractions classified according to the number of teeth extracted. He comments sorrowfully on the disinclination of hospital doctors to attend to their patients' teeth. Prophylactic dentistry is still considered a costly luxury in his district, and the resultant sins of omission are often visited on the general practitioner. A study such as this is valuable by itself, but its value would be much enhanced if it could be compared with similar studies in other areas and at other times.

SULPHANILAMIDE ERUPTION

WRITING in the *American Journal of Diseases of Children* (1938, **56**, 1256), E. R. Schlesinger and W. L. M. Mitchell, jun., propose the following "natural history" of sulphanilamide eruption. There is, they say, a prodromal fever, sometimes preceded by transient leucopenia and followed by a morbilliform rash, often with splenomegaly. The eruption develops within 5–17 days of commencement of the treatment and lasts 36–96 hours. Subsequently secondary leucopenia has been observed. Later administration of sulphanilamide has produced a scarlatiniform rash with fever and leucocytosis within a few hours, while continued administration has been associated with increased capillary fragility and occasionally arthritis. Passage of time and increase of the dose for a short period, or repeated large doses at intervals, have decreased or abolished these reactions.

Schlesinger and Mitchell themselves report 10 cases in children of ages ranging from four to eleven years.

AN INFORMATION SERVICE IN HUMAN GENETICS

LAST year the Bureau of Human Heredity issued to members of their information service a bulletin to help those engaged in current research in human heredity to get in touch with other workers in the same subject. A second bulletin is now in prospect and information is already to hand from many research institutions as well as from individual workers abroad. The bureau is desirous to obtain the coöperation of those interested in particular studies of human genetics in this country. Such workers are invited to send to the bureau an intimation of the subjects on which they are engaged, not to exceed 100 words, accompanied by a subscription of 5*s.* and including their address and the name of the institute (if any) to which they are attached. The material so collected will be issued in three languages to subscribers only. The office of the bureau is at 115, Gower Street, London, W.C.1.

Births, Marriages and Deaths

BIRTHS

ANDERSON.—On Feb. 8, at Glasgow, the wife of Dr. Thomas Anderson—a son.

FINLAISON.—On Feb. 9, at Burnsall Street, Chelsea, the wife of Mr. F. H. Finlaison, F.R.C.S.—a daughter.

FULLERTON.—On Feb. 11, the wife of Captain A. H. T. Fullerton, R.A.M.C.—a son.

HUGHES.—On Feb. 11, at Sutherland Avenue, Maida Vale, the wife of Dr. William Hughes, Colonial Medical Service, Nigeria—a daughter.

KERSLEY.—On Feb. 12, the wife of Dr. G. D. Kersley of Bath—a son.

THOMAS.—On Feb. 11, at King's College Hospital, London, the wife of Dr. René Thomas, of York—a son.

WHYTE.—On Feb. 8, at Aberdeen, the wife of Captain A. G. D. Whyte, R.A.M.C.—a son.

WINTERTON.—On Feb. 8, at the London Clinic, the wife of Mr. Ralph Winterton, F.R.C.S.—a daughter.

DEATHS

CROWDY.—On Feb. 12, at Pinhoe, Exeter, Francis Demainbray Crowdy, M.A., M.D. Oxfd, aged 81.

CULMER.—On Feb. 7, John James Culmer, M.R.C.S., of Nassau, Bahamas, aged 72.

DOUGLAS.—On Feb. 14, at Droitwich, Major-General Henry Edward Manning Douglas, C.B., V.C., L.R.C.P.E., A.M.S. (retd.)

HOME ROSS.—On Feb. 10, in London, John Ross Home Ross, M.B. Edin., F.R.C.P.E., of Lower Kingswood, Surrey.

KIRBY.—On Feb. 9, 1939, at Bath, Thomas Kirby, aged 71 years. A governor and formerly registrar of the Royal National Hospital, Bath.

MCCARDIE.—On Feb. 14, at Warwick, William Joseph McCardie, M.B. Camb., M.R.C.S., aged 74.

OKELL.—On Feb. 8, at Chesterton, Cambridge, Charles Cyril Okell, M.C., M.B., Sc.D. Camb., F.R.C.P., aged 50.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages and Deaths.